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REFERRED PAIN FROM BONE POINTS

BY

RAFFAELE BASTIANELLI, M.D.Rome, Hon. F.R.C.S.Eng.

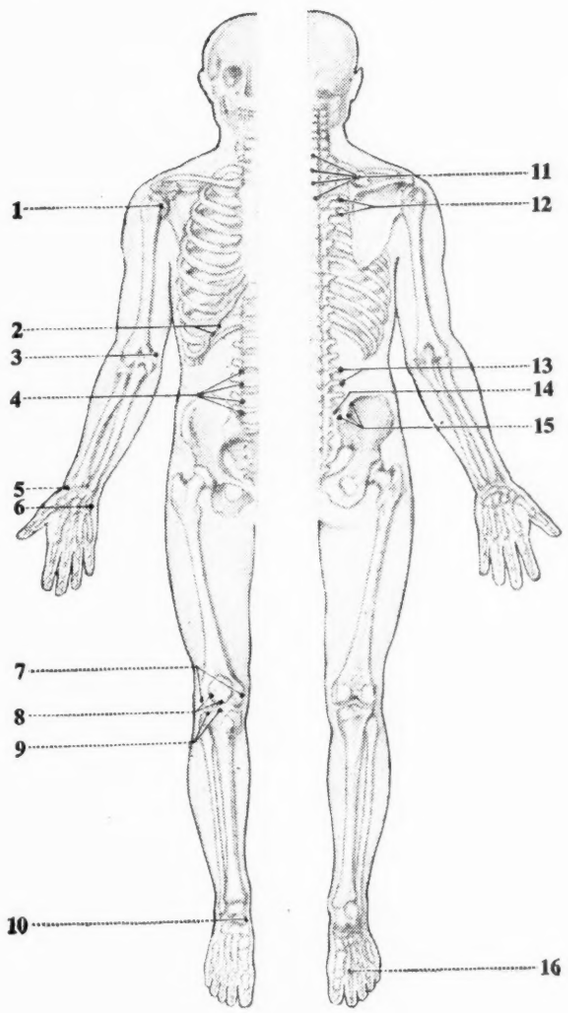
Professor of Clinical Surgery, Royal University of Rome; Foreign Corresponding Member of the British Medical Association

The very stimulating articles by Sir Thomas Lewis and Mr. J. H. Kellgren in the *British Medical Journal* of February 12, 1938 (pp. 321 and 325), and the one by Dr. James Cyriax in the issue of December 31, 1938 (p. 1367), have prompted me to add to their experience that which I have acquired in the study of pain, referred or not, arising from some bone points. In a lecture delivered at the New York Academy of Medicine on October 5, 1922, I expressed my views on the subject,* but did not succeed in stimulating similar studies, perhaps because the lecture remained unknown. I think it will be useful for practical purposes to summarize it briefly.

It may be thought incorrect to speak of bone pain, since periosteum and fibrous, muscular, and ligamentous insertions may be involved. I wish, however, to use this term for the sake of simplicity and because of the possibility of topographic anatomical precision.

When examining patients who complained of severe internal or external pain it was possible in many cases, even when the pain was referred over a wide area, to find a very limited point over a bone from which it could be elicited by pressure. I was led to adopt that method of examination through the experience gained in cases of obscure external pains, of which the following is an example.

A woman of middle age was suffering intense pain which had appeared in a rather acute form three months before, and was located by her in the right shoulder as far back as the scapula and along the arm. The pain was tearing and pulsating in character at times, worse at night, and was increased by certain movements, so that she preferred to keep the arm still. She was treated a long time for rheumatic arthritis of the shoulder without success, and finally left as a chronic case. There was no noticeable wasting of the deltoid muscle; the interarticular line and the bicipital groove were not tender to pressure; and the active and passive movements outwards and backwards, which were limited and painful, could be made easier by holding up the elbow and relaxing the joint.



What impressed me was that by exercising pressure on the head of the humerus at a point under and a little to one side of the coracoid process a sharp pain could be constantly elicited. Many subsequent observations led me to believe that this point is situated just outside the joint capsule or at its insertion in the groove separating the articular surface of the head of the humerus from the small tuberosity (anatomical neck), where the inferior attachments of the coraco-humeral ligament are also situated (Figure, point 1). This point is covered by the anterior fibres of the deltoid, and can be reached either direct or obliquely from the deltoid-pectoral interstice. This constancy, with the extreme limitation of the painful area, so that even one millimetre outside of it was free from pain, and the possibility of moving the arm if supported, impelled me to exclude any articular involvement and to attribute all the local and referred pain to that special bone point. By repeatedly injecting 10 to 20 drops of a 3 in 100 carbolic solution, holding the point of the needle in direct contact with the bone, the woman was cured.

Painful Bone Points in Various Conditions

That experience induced me to search for such points in various conditions of pain, and as they were found in many regions of the skeleton in cases of obscure origin, or with diagnosis of arthritis, bursitis, and even visceral diseases, I concluded that the existence of painful bone points was certain and that it had a general significance for diagnostic purposes. Of such points some, and the most frequent, are typical—that is, they are to be found exactly in the same spots. Some are atypical—that is, less frequent and in variable position. Typical for the upper limb are the one already mentioned (the superior humeral

*The Wesley M. Carpenter Lecture: *New York med. J.*, 1923, 117, 125.

point), the one on the internal epicondyle (point 3), on the tip of the styloid process of the radius (point 5), more rarely on the styloid process of the ulna, on the pisiform (point 6), and on the dorsal aspect of the first and second metacarpal bones. In the lower limb the point most often involved is on the external tibial condyle (point 9), anteriorly just underneath the articular surface, on the so-called infraglenoid margin (margo infraglenoidalis). The joint capsule ends just above or at that point, which has nothing to do with the tender points one finds so often at the insertion of the lateral ligaments.

From the limited tender point the pain spreads elsewhere. From the superior humeral point it can be referred to the anterior and posterior aspects of the shoulder, to the scapula, and along the arm; from the tibial point it is referred to the knee and to the leg in such a way that patients speak only of the referred regions and generally cannot locate the pain. Such extension of the pain is variably connected with tender points in other regions, as, for instance, on ribs (point 12).

Differential Diagnosis

Having these details in mind the differential diagnosis from arthritis in the case of humeral or tibial points is not difficult. There is no effusion or swelling of the joint; the active movements are limited in some directions, but the passive ones can be accomplished almost completely if the limb is supported and the joint not subjected to strain. It is characteristic of the painful spots that they are very limited in area, sometimes not bigger than a pinhead, so that no confusion can occur. With regard to the differential diagnosis between the tender superior humeral point mentioned above and arthritis, I may add that the same location of pain is said to exist in cases of shoulder arthritis. In every manual of surgery, among the signs of this disease is included that of pain elicited by pressing on the head of the humerus near or in the deltoid-pectoral groove. According to some this tender area corresponds to the convexity of the articular surface of the head. But this is not so, for that portion of the head is inaccessible except when the arm is rotated outwards.

In cases of arthritis the tender spot is accompanied by swelling of the region, by pain along the bicipital groove, and by great or even total incapacity of the joint. If the tender spot exists alone it is not a sign of arthritis. As I have said, the patients do not point to the existence of a local trouble: they speak of pain either diffuse around the joint or radiating to a distance or during movements, aggravated sometimes in the night or having a neuralgic character. The course of the disease may be acute; it is generally slow and obscure at the onset but less so with time, and lasts even for more than one year and prevents the full use of the limb. Causes cannot be found, except the so-called rheumatism or sudden strain or an exaggerated use of the limb.

Among structures which could be considered to be the seat of the pain, the coracoid bursa in the upper end of the humerus has been described by Goldthwaite and Codmann; but so far as I know this disease has not been acknowledged in Europe, and its localization and extension do not correspond with the point I am speaking of. Many painful troubles of the upper limb not precisely localized, and which bear such names as, for instance, arthralgia or neuralgia of the joint, muscular pain, and brachialgia, are either due to the superior humeral point alone or are associated with tender spots on the fourth or fifth rib posteriorly between scapula and spine, on the scapula itself, or on the spinous processes. Naturally a close search, including the use of *x* rays, has to be made to avoid errors.

Styloid Process of the Radius

The location of pain to the styloid process of the radius is common, especially in women. They complain of pain in the wrist, chiefly during dorsal or ulnar flexion of the hand, in abducting the thumb, or in grasping an object, without being aware of its precise locality. Many complain, too, of pain running down the dorsal aspect of the thumb and of the hand, or up in the limb, and are incapable of any work, even playing the piano or sewing. There is no change in the shape of the wrist, and all the movements can be made if not forced. The painful spot is as small as a pinhead, and beyond it there is no pain. Immobilization helps, but is not completely effective, and I have seen patients with a diagnosis of periostitis, arthritis, or even tuberculosis of the wrist wearing plaster casts for months. But the wrist-joints have nothing to do with the pain referred in the above cases.

Neuralgia of the joint and inflammation of tendon sheaths have often been diagnosed. The disease called by De Quervain tendovaginitis stenosans of the extensor brevis and abductor longus pollicis, and confirmed by Keppler and others, is unknown to me. Its diagnosis is based on pain along these tendons, on the presence of a painful spot, and on a certain thickening of the sheath, and he has cured it by cutting the tendon subcutaneously. I have never seen a case, and I doubt the correctness of interpretation. Certainly it is a strange fact that a tendon sheath should become narrowed without any cause. De Quervain never found signs of inflammation. The vagueness of the pain, the location, the frequency in women, and the strangeness of the disease make me think that a painful spot in the inferior radial epiphysis might be the cause. I will mention briefly the so-called epicondylitis or epicondylalgia (tennis elbow), well known for years past, and attributed to various causes and explained by many pathological suppositions. Here, too, the tender spot is extremely small and there is no pain outside that very limited area.

Pain in the Lower Limb

In the lower limb, besides the points above spoken of, there are others typical and atypical, as on the internal condyle of the femur (point 7), on the apex of the patella (point 8) or on its borders, on the internal side of the os navicularis (point 10), on the dorsal aspect of the base of the second and third metatarsal bones, and on the posterior and inferior surface of the calcaneus. I will not venture to say that many of the so-called achillodynias, podalgias, metatarsalgias, and especially the Morton painful foot, are only due to painful bone spots, but certain it is that such vague diagnoses should not be made without first looking for them. In the so-called Morton foot it is easy to find a very limited tender spot on the inferior surface or the head of the fourth metatarsal (point 16). The results of treatment are of more importance than any supposition or discussion, and I am convinced of the correctness of my observations.

Pain in certain of the ribs is common, alone or associated with pain in the head of the humerus. I have seen in women a spot on the inferior costal edge (point 2), either left or right, and the interpretation had always been that some internal disease, especially of the gall-bladder, is present. I have treated cases in which the gall-bladder had been removed with no result, and it was

easy to find a tender spot on the rib and cure the patient with local injections. The vertebrae, especially their spinous processes (point 11), are often the seat of pain spreading up and down, along the arm, and towards the waist, the patient not being aware of its location. Treatment with plaster jackets, immobilization for years, and miraculous cures have not been infrequent in my experience. Women and neurotics are generally affected, so that hysteria has to be eliminated. In these cases the *x* rays are invaluable, but the clinical examination also can exclude organic lesions.

The sacral region, and especially the ilium (points 14 and 15) or sacrum near the ilio-sacral joint, often presents tender spots from which pain is referred to the buttocks, waist, and abdominal wall. Coccygodynia belongs to this category. One can say in general that these and other spots, particularly when near to joints, muscles, and tendons, may give rise to incorrect interpretations. They acquire more importance when a painful spot on the rib edge is mistaken for an internal affection. I recall that painful spinal spots in the course of gall-bladder diseases have been found by Mackenzie, Vidal, and others. I do not venture to doubt their existence: I only say that tender bone points may give rise to referred pain, even at a distance, towards and inside the abdomen. Many times I have heard women, very rarely men, complain of pain around the waist, spreading anteriorly and downwards to the inferior abdominal quadrant, for which no organic cause could be found. Diagnoses of floating kidney, nephralgia, appendicitis, and enteralgia had been made. If the patient is made to lie on one side it is possible to find an exquisitely sensitive spot at the tip of the third or fourth transverse lumbar apophysis (point 13), and this is almost always associated with pain on pressure on the lateral surface of some lumbar vertebral body, generally the one corresponding to the transverse process (point 4).

When examining patients for appendicitis one should have in mind that possibility. If the hand presses deep into the iliac fossa on to the underlying bone, or, if more medially, on to the vertebral bodies, very often pain is complained of and the diagnosis of chronic appendicitis is made and confirmed by incorrect palpation manœuvres under the screen. Such a pain has no value in the diagnosis: it may be present even in true cases of appendicitis, but has nothing to do with it. I doubt if the so-called Morris point—which that worker located deeply at one and a half inches from the umbilicus, on the line between the iliac spine and umbilicus, on the right side—should not be interpreted in this way. Therapeutic success confirms the diagnosis of tender bone points. The cause of this localized pain cannot be found. The majority of the patients are women, sometimes neurotic or with rheumatic conditions, or even affected by limited tuberculosis; but healthy men and women may be affected too.

Morbid Anatomy of Painful Bone Spots

The morbid anatomy of these bone spots is unknown to me. Small chips of bone excised with the periosteum have never shown structural changes. In a general way one may ask, What structures are responsible for the pain—periosteum, or the fibrous attachments to the bone, or the overlying muscles? In many cases—as in connexion with the tibia and the styloid process of the radius—structures other than bone may be excluded. The pain on vertebral bodies I have already discussed. Comparison of the points given in my figure with Mr. Kellgren's sketches shows a great topographical similarity if not coincidence, and as a result of my observations I must exclude the possibility that the seat of pain could be in a muscle overlying the bone. I will not venture into hypothesis or discuss the question of diagnosis any further, since this paper is not meant to be exhaustive.

Treatment

It remains to say something on treatment. In the past I used to inject 10 to 20 drops of a 3 in 100 carbolic solution (1 in 100 may be used to begin with) direct, and exactly, on the bone spot. Pain is sometimes increased for hours, especially when the seat is the radius; then it diminishes and almost wholly disappears after from one to four injections. More than that number are useless.

It has been a source of satisfaction to me to read in Llewellyn Jones's book on fibrositis that Wilfred Harris has cured brachialgias by injecting alcohol on tender spots accurately localized on the scapula and the ribs. For some years I have used with success infiltration with novocain, and the results have sometimes been striking. As it does not usually aggravate the pain (though it may do so exceptionally after two to three hours), I think the best plan is to begin with it and to resort to the carbolic if unsuccessful. Is it possible that, when injected in quantity in cases of so-called muscular pains, it may reach and permeate the periosteum and structures attached to the bone and cure the pain in this way? I am sorry not to be able to discuss the quality of pain; but my observations are old, and, though as accurate as I could make them, they are far from fulfilling the requirements laid down by Sir Thomas Lewis. His suggestions will prove very valuable for the future. Also I believe that such painful spots on bone can be analysed even by studying normal people. Not rarely I have found in these persons the internal epicondyle, the third lumbar transverse process, and other bone points respond with pain if pressed accurately in a limited zone, as if these areas were for some reason the most susceptible to the localization of this obscure disease.

In my lecture of 1922 I stated my opinion that the field of pain is very large and the study of it most difficult and complex, and that I had presented only a very limited part of it. My only excuse is that I have tried to study this small part from a comprehensive point of view such as I believe has not been done before.

In the United States the cold storage of eggs is an important industry, about 3,000 millions being stored in commercial warehouses. The eggs are placed in store during March, April, May, and June, when production is large and eggs are cheap, and withdrawal begins in August, increasing gradually until mid-November, when the price has risen; very few eggs are carried over to January. Large quantities are stored for one to two months only, and then released on a rising market. In this country, on the other hand, few of the 3,350 million eggs produced annually are stored either by housewives or in commercial stores. The number of inquiries addressed to the food investigation organization of the Department of Scientific and Industrial Research has shown, however, that there is a considerable interest in the subject. The Department has accordingly issued a leaflet on the principles and relative merits of the methods used. Those dealt with are cold storage in air alone, partial "gas storage"—that is, cold storage with the addition of 2 to 2½ per cent. of carbon dioxide in the atmosphere of the store—and full "gas storage," involving cold storage in an atmosphere containing 60 per cent. of carbon dioxide. Copies of the leaflet, *The Cold Storage and Gas Storage of Eggs*, can be obtained gratis from the Secretary of the Department, 16, Old Queen Street, Westminster, S.W.1.

TWO CASES OF HAEMATOLOGICAL INTEREST

BY

IAN MacKAY, M.D., D.P.H., D.T.M. and H.

Flight Lieutenant, R.A.F.

(WITH SPECIAL PLATE)

The following two cases are considered uncommon enough to merit publication. The first is that of a healthy adult in whose blood macropolycytes have been observed over a period of four years. The second is a case of agranulocytosis in which marked erythrophagocytosis occurred in the circulation following blood transfusion. Photomicrographs of the blood in each case are reproduced (Plate: Case I, Figs. 1–3 and 5–8; Case II, Figs. 9–15).

Case I: Macropolycytes in Health

The macropolycyte is a rare type of blood cell described in detail by Cooke (1927). It is a giant polymorphonuclear leucocyte more than 16 μ in diameter and occasionally exceeding 25 μ. There is usually hypersegmentation of the nucleus, and nine or more lobes may be present. Osgood and Ashworth (1937) suggest for this type of cell the name of "polylobocyte." Macropolycytes are found most commonly in pernicious anaemia, but they also occur occasionally in various infections, generally where there is a profound bone-marrow reaction, when they are associated with the presence of myelocytes in the circulation. I have observed them in such varied conditions as tuberculosis, erysipelas, osteomyelitis, malaria, phlebotomus fever, ankylostomiasis, and leprosy. Cooke (1934) reports their occurrence in health.

The present case first came under observation in Iraq in 1935 while investigating the changes in the leucocyte state which occur in health in that country. The individual was one of five healthy airmen, in the blood of all of whom macropolycytes were found (Kennedy and MacKay, 1936). A year later, in Iraq, examination of his blood showed that giant cells were still present. At that time it was suggested that these cells, associated as they were with myelocytes in the blood and with a pronounced deviation of the Arneth count, were an indication of marrow stress due to climatic conditions.

This airman, who is a medical orderly, returned to the United Kingdom in 1937. His blood was again examined, and macropolycytes were found to persist. Repeated examinations during the past year have shown an average of one giant cell in every 500 leucocytes, although the other blood findings—including the haemoglobin, red cell and reticulocyte counts, sedimentation rate, total and differential white cell counts, and the Arneth count—were normal. Clinical investigation has revealed no abnormality, and, apart from phlebotomus fever in 1937, he has had no illness of any kind for more than ten years.

Little is known of the significance or the mode of development of the macropolycyte, but its distinctive morphology lends it interest. It may be that it is a normal polymorph which has developed beyond its usual span, or that it is the result of abnormal stimuli acting on the bone marrow. In any case it would appear that its development may result from two quite different sets of factors. For it is found on the one hand in pernicious anaemia, a leucopenic disease with a shift to the right in the Arneth count, and on the other hand in infective conditions where there is a leucocytosis and a shift to the left in the Arneth count. The suggested explanation that it is a leucocyte which, locked in a tissue space, has grown excessively before being released into the circulation would appear to be as reasonable as any.

Giant cells of the eosinophilic and basophilic series have been described, but they are very rare, and hypersegmentation of the nucleus is seldom found. In the present case two giant eosinophils, one of which is shown in Fig. 3, were seen. For comparison a giant basophil from a case of leprosy is also included (Fig. 4).

Case II: Erythrophagocytosis following Blood Transfusion

The patient was a man aged 44. His history is as follows. He had measles in infancy. During the war he served for three and a half years in the Mediterranean area, where he had dysentery (type unknown) in Gallipoli in 1916, and soon after in Salonika benign tertian malaria with, he stated, twenty to thirty bouts of fever. In May, 1937, he developed a septic leg; in July of the same year he had an influenza-like attack; in October he had a septic hand, and in November pleurisy.

On December 22, 1937, he was admitted to hospital with acute anaemia and ulceration of the mouth. His treatment included pentose nucleotide and blood transfusion. He died eight days after admission to hospital.

The following organisms were found in the ulcers of the mouth and throat: Vincent's spirochaetes and fusiform bacilli, *Oidium albicans*, non-haemolytic streptococci, and coliform bacilli. On admission the blood picture was: erythrocytes, 1,510,000 per c.mm.; haemoglobin, 35 per cent.; colour index, 1.2; leucocytes, 800 per c.mm., of which 80 per cent. were lymphocytes, 18.75 per cent. monocytes, and 1.25 per cent. neutrophils. There was considerable irregularity in the shape and size of the red cells, and normoblasts were present.

The day after admission to hospital the patient had a blood transfusion. This produced only transient benefit, and the next day the red cell count was 1,490,000 per c.mm. and the haemoglobin 30 per cent. The leucocyte count, however, had risen to 2,000 per c.mm. and the white cell picture was considerably altered. Only 1.5 per cent. were neutrophils, the increase in the total count being apparently due to an influx of reticulo-endothelial cells. Typical lymphocytes and monocytes were present and numerous macrophage cells, which varied greatly in size, staining reaction, and configuration of the nucleus. The gradation from the lymphocyte on the one hand and the monocyte on the other to adventitious macrophage was such that it made the differential count very difficult. Small round cells were present, resembling lymphocytes but with deeply basophilic cytoplasm, others were of the plasma cell type. Of the large cells two examples are shown in Fig. 9. One has finely granular cytoplasm like that of the typical monocyte of the blood but the nucleus is divided, while the cytoplasm of the other is intensely basophilic.

A striking feature was the ingestion of erythrocytes by the macrophage cells which was in progress. Of the total leucocytes 9.5 per cent. had ingested one or more red cells. Some examples of this are shown in Figs. 10 to 15. Fig. 10 shows the initial stage of the process, and in Figs. 11, 12, and 13 are cells containing one, two, and four erythrocytes respectively. In Fig. 14 is a macrophage packed with red cells; Fig. 15 shows the end-result where the contained red cells are broken down into globular particles and the macrophage has rounded off and is presumably about to pass from the circulation to the spleen.

The probable diagnosis in this case is that of primary agranulocytic anaemia of the aplastic type; but this diagnosis is unconfirmed, since, unfortunately, permission for post-mortem examination was not obtained. In the treatment of agranulocytic anaemia blood transfusions have been reported as more detrimental than beneficial (Jackson, Parker, and Taylor, 1932). In the present instance the immediate reasons for the failure of blood transfusion are readily understandable. Since the administration of pentose nucleotide produced no leucocytic response none could be expected from the injection of

foreign white cells; and the red cells of the transfused blood were rapidly phagocytosed. There was no other evidence of incompatibility between the patient's blood, which was Group A, and the donor's, which was Group O. There was no reaction following the transfusion and no haemoglobinuria. The death of the patient seven days later was easily accountable by his general condition.

The phenomenon of auto-erythrophagocytosis—ingestion by macrophages of the patient's own red cells—has been observed *in vitro* and has been described as occurring in the circulation in malaria and in trypanosomiasis by Connal (1912) and Macfie and Johnston (1913). In the literature consulted no reference was found to erythrophagocytosis either in agranulocytosis or as a result of blood transfusion. In this case the condition probably indicates either a degree of incompatibility between patient's and donor's blood insufficient to produce other reaction or, more likely, increased sensitivity of the patient to foreign red blood cells.

For the data and material described in Case II I am indebted to Air Commodore H. E. Whittingham.

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THE ANATOMY OF THE BRONCHIAL TREE*

BY

J. HARDIE NEIL, D.S.O., F.R.A.C.S., F.A.C.S.
President, Pan-Pacific Surgical Association; Aural Surgeon, Auckland Hospital, New Zealand

W. GILMOUR, M.D.Glasg., D.P.H.Oxon
Pathologist, Auckland Hospital

AND

F. J. GWYNNE, M.B.Sydney
Radiologist to Mater Misericordiae Hospital, Auckland

(WITH SPECIAL PLATE)

Recent advances in radiology, bronchoscopy, and thoracic surgery have called for a description of the anatomy of the bronchi that will allow students and clinicians to visualize readily their distribution to the lung tissue. Current anatomical textbooks do not furnish the clinician or thoracic surgeon with the means for the precise localization of pulmonary lesions. The technically perfect film and the brilliant bronchoscopic field are of little avail if there is uncertainty in the conception of the anatomy of the bronchial tree.

The Work of Ewart and Others

Ewart (1889), in his classical work on the bronchi and pulmonary vessels, feared that excessive detail might cause the student to recoil from the study. His book contains a meticulous description of the bronchi down to the finest peripheral branches. He made continued reference to the work of Aeby (1880), who approached the subject from the point of view of comparative anatomy.

* Read at the meeting of the Auckland Division of the British Medical Association, November, 1938.

A comparison of the diagram of the bronchial tree of Aeby with that of Ewart shows that the former allows one to visualize the bronchial tree at a glance, while the latter with its multiplicity of smaller branches calls for an intensive study that confuses any who attempt to get a practical conception of the fundamentals. Ewart's description of the foliage and finer twigs tends to obscure the picture of the trunk and main branches, the recognition of which is all-important for a reasonably rapid conception of the general architecture of the lungs. Kramer and Glass (1932), apparently unaware of Ewart's work, used a terminology which allows one to picture readily the location of the segments involved by lung abscess. Nelson (1934), whose untimely death must be deemed a catastrophe to thoracic surgery, published an article dealing mainly with bronchiectasis, in which his lucid exposition of the anatomical data showed that he was conversant with the work of Ewart.

It is a tribute to Ewart and Aeby that, with crude appliances and lack of radiology and modern pathological technique, they arrived at a description which can hardly be improved upon apart from some detail. Ewart was quite definite as to the nature of the broncho-pulmonary segment as later described by Kramer and Glass. The latter state that each tertiary bronchus, with the lung tissue it serves, forms a distinct entity, the limits of which can be defined and the relations of which to the chest wall can be delineated. Ewart said that "within each lung large groups of lobules are kept in practical isolation from each other as regards their air supply. Each of these sublobar groups may be considered as forming separate respiratory districts." The recognition of this fact must cause all clinicians and radiologists to think and speak in terms of segments in the localization of lesions such as infections which apparently in the first instance affect a single broncho-pulmonary segment. Only in gross pathology do they pass over the border into adjacent segments and lobes (Figs. 1 and 2). Ewart certainly places students under a debt of gratitude by applying names to the bronchi that connote their territorial distribution and anatomical relations, thus avoiding the terminology of Aeby with its repetition of similar names qualified only by numerals.

Nomenclature: Some Suggestions

At this point a few observations on the terms used in describing the bronchial tree may be useful. The terms primary, secondary, and tertiary bronchi have been given different interpretations by different writers. It seems to us important to recognize as definite entities those branches which supply separate pulmonary segments that can be sharply defined by inflation and the relations of which to the chest wall can be delineated. By some these have been termed tertiary bronchi. We would suggest that they be termed segmental bronchi. This would avoid all confusion in regard to nomenclature.

The main bronchus extends from the bifurcation of the trachea down to its final subdivision into the axillary basal and posterior basal segmental branches. There appears to be no reason, either anatomical or clinical, for subdividing the main bronchus into one or more parts. We would therefore suggest that it be referred to as the main bronchus. Anatomical and clinical localization is readily afforded by the bifurcation and by the openings of the various vestibules and branches. As the segmental bronchi to the upper and middle lobes on the right side and the upper lobe on the left side (which is common to the upper and middle) do not arise directly from the main bronchus it is necessary to have a name for this intervening part, and we suggest that these areas be

referred to as the vestibules. We therefore think that the following names might be used to identify the various parts of the bronchial tree: (1) main bronchi; (2) vestibules; (3) segmental bronchi. There is no practical utility in giving names to the further subdivisions to the bronchial tree. Any attempt to do so would introduce a complicated system of nomenclature, which we have set out to avoid.

We now show the tables of Ewart and of Kramer and Glass naming the segmentary bronchi, and offer our suggestions for a revised nomenclature.

EWART	KRAMER and GLASS	SUGGESTED NOMENCLATURE
Upper Lobe:	*Upper Lobe:*	*Upper Lobe:*
Apical—*a*	Apical—*a*	Subapical—*b*
Posterior apical—*b*	Paravertebral—*b*	Apical—*a*
Pectoral—*c*	Anterior—*c*	Axillary—*c*
Axillary—*d*	Axillary—*d*	Anterior—*d*
Middle Lobe:	*Middle Lobe:*	*Middle Lobe:*
Pectoral—*e*	Anterior—*e*	Anterior—*e*
Axillary—*f*	Axillary—*f*	Axillary—*f*
Lower Lobe:	*Lower Lobe:*	*Lower Lobe:*
Posterior horizontal—*g*	Apical—*g*	Apical—*g*
Retrocardiac—*h*	Cardiac or mesial—*h*	Cardiac—*h*
Antero-basic—*i*	Antero-lateral—*i*	Subapical—*j*
Lesser posterior horizontal—*j*	Postero-lateral—*k*	Anterior basal—*i*
Axillary basic—*k*	Paravertebral—*l*	Axillary basal—*k*
Posterior basic—*l*		Posterior basal—*l*

The letters in italics denote the segmental bronchi in the order given by Ewart, and Kramer and Glass.

In this list we have placed the bronchi in the sequence in which they leave the bronchial tree. This arrangement is helpful to bronchoscopists. Reference is made to the variable position of the subapical bronchus (or bronchi) in the lower lobe later in the text (Figs. 3 and 4).

Upper Lobe

In the upper lobe, Aeby and Ewart gave full representation to the lateral distribution of the posterior apical of Ewart, which we term subapical. Kramer and Glass, to whom we personally are indebted for elucidation of the bronchial tree, were apparently not aware that the surface distribution of the segment extended to the junction of the greater and lesser fissures of the lung on the right side, where we have invariably found it distinct from, and not a branch of, the apical as described by Ewart. On the left side it comes off early on the dorsal aspect of a bronchus that continues on as the apical. As this segment is recognized by radiologists as a site of predilection of tuberculosis, its importance might well be stressed by a more complete territorial designation. To accomplish this would involve calling it the mediastinal-paravertebral-axillary. This is obviously unsuitable. The term subapical is suggested, as the segment corresponds in distribution with the one we have similarly named in the lower lobe.

Middle Lobe

In the middle lobe the choice of terms lies between anterior and pectoral. One would like to pay deference to Ewart's classical and monumental work and call it pectoral, but anterior is suggested on account of its universal application.

Lower Lobe

In the lower lobe "apical" is obviously a convenient term, although Nelson used the term "dorsal" and again pointed out that it is at times a separate lobe. "Cardiac" is a term used by students of comparative and human anatomy, although the segment has no exclusive relation to the heart. The segment occurs only on the right side. In the left it is absent, the corresponding area of the lung being served by the anterior basal. In the koala, or Australian native bear, this segment is incorporated in the right lung as in the human, but in all the other animals that we have investigated it is a separate lobe.

The term "base" is used by anatomists when referring to the diaphragmatic surface of the lung. Ewart refers to the base of the lung as "the broad lower extremity of the lung including its inferior third," although he recognizes that part of the middle lobe in the ventral or anterior aspect of the lung would come within these limits. Practically all the lung territory served by the anterior basal (anterior division), the axillary basal, and the posterior basal segmental bronchi is contained in this so-called "base." It is a convenient term, practical and ingrained in the literature and clinical description. It is consequently worthy of retention, and substitution is difficult.

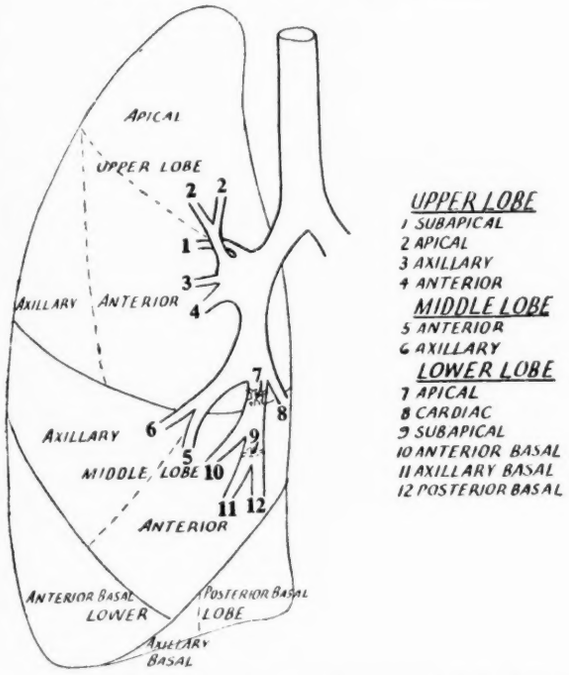
The terms anterior basal (although this has an anterior and a lateral division, each of which at times has a separate bronchial opening), axillary basal, and posterior basal describe the location of the segments with exactitude and are acceptable in that they resemble Ewart's original designations. Our findings must necessarily be in general agreement with those detailed by Ewart and more conveniently represented by Kramer and Glass, and Nelson, but we find in the subapical segmental bronchus or bronchi of the lower lobe a probable source of confusion to anatomists and also to bronchoscopists.

Between the origin of the apical bronchus of the lower lobe and the origin of the axillary basal from the main bronchus are found one or more openings. Before our recent access to Ewart's book we thought that we were the first to describe them, as they were not figured by Kramer and Glass, and Nelson. However, Aeby depicts one on each side of the tree in the position we have mentioned, and Ewart refers to it as the lesser posterior horizontal, a single bronchus on the right side, taking origin between the anterior basal and axillary basal. On the left side he refers to it as a branch of the axillary basal.

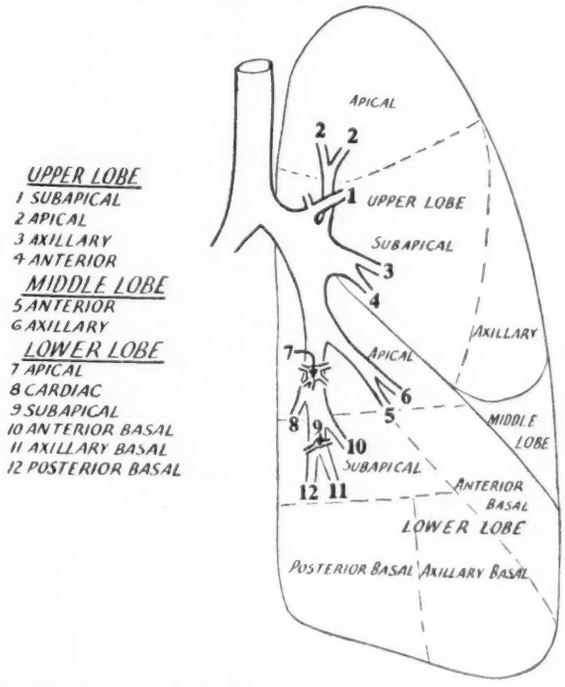
In our specimens we have found from one to three such subapical bronchi on the right side, and one on the left, quite apart from the other segmental bronchial openings mentioned. In a relatively simple type of lung, such as that of a pig (Plate, Fig. A), distal or caudal to the apical bronchus of the lower lobe may be seen a series of branches of descending magnitude on the dorsal, lateral, ventral, and, in lesser numbers, on the mesial aspects. Homologues of some of these may be found in the monkey, cat, sheep, dog, opossum, rabbit, kangaroo, wombat, koala, and duiker deer. Each mammal develops a characteristic architecture of its bronchial tree. Some bronchi individualize themselves in accordance with the pattern of the tree of the species, whilst others remain vestigial or disappear.

With a knowledge of the positions of the segmental bronchi in man, one can readily recognize the homologues in mammals. Distal to the apical bronchus of the lower lobe we found in all our mammalian specimens homologues of the subapical bronchus or bronchi. In the human we have observed it arising from the dorsal, mesial, or lateral aspect of the right main bronchus. We show an illustration (Plate, Fig. B) of the right bronchial stem in a child with a subapical bronchus in each of these three positions. On the left side (Plate, Fig. C) we have found it situated dorsally, mesially, laterally, and twice ventrally. It may be absent on the left side, in which case we have found a branch going to its customary distri-

RIGHT LUNG, ANTERIOR VIEW

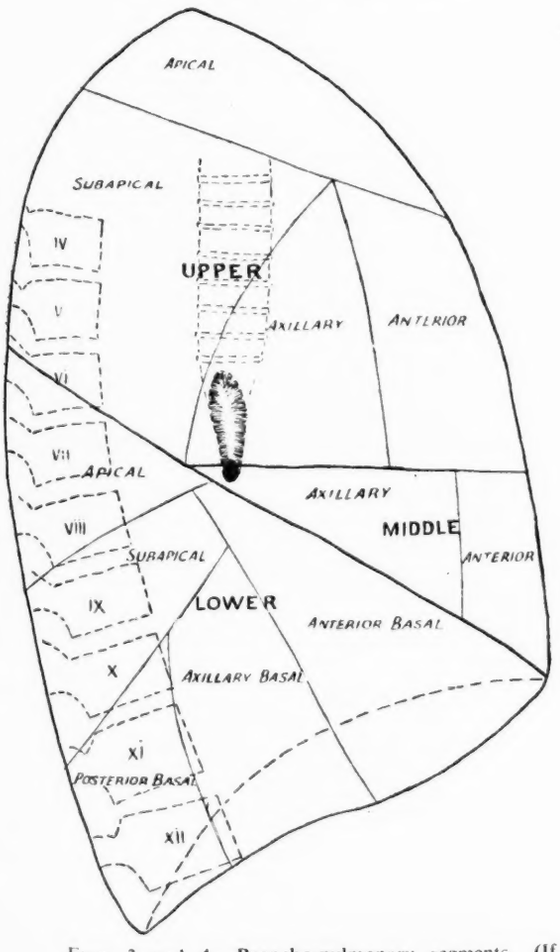


RIGHT LUNG, POSTERIOR VIEW

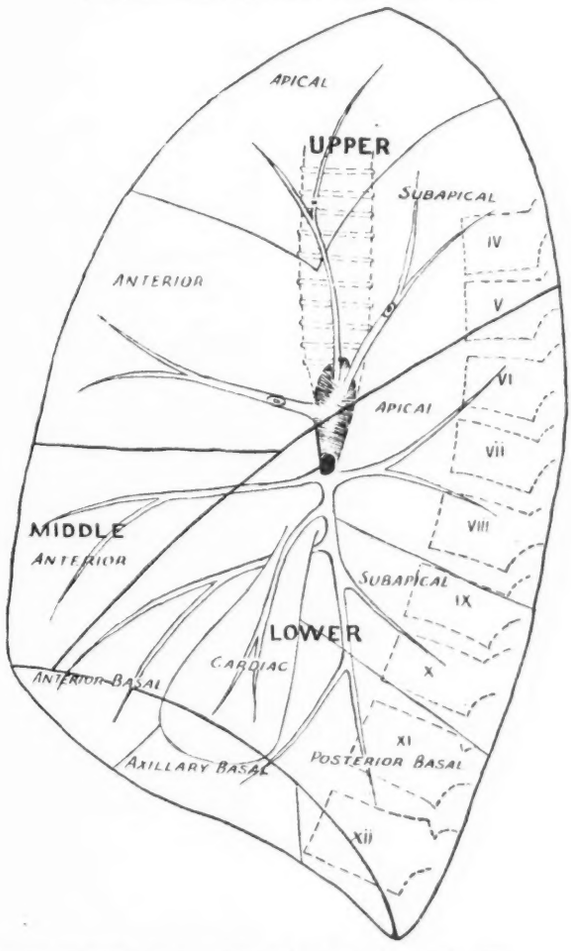


FIGS. 1 and 2.—Diagrammatic drawing of the broncho-pulmonary segments and the beginning of the segmental bronchi.

RIGHT LUNG, LATERAL VIEW



RIGHT LUNG, MEDIASTINAL VIEW



FIGS. 3 and 4.—Broncho-pulmonary segments. (If these diagrams are enlarged by a pantograph on to sheets of cellophane so that the transverse diameter at the level of the seventh dorsal vertebra is about seven and a half inches, superimposition on a standard lateral film will allow the broncho-pulmonary segments to be delineated.)

bution arising from the axillary basal (described by Ewart as being its only origin) or from the posterior basal. As stated above, it is additional to all other constant bronchi in the lungs of man and of the animals we have examined. The reason for its occasional absence from the common site in the left lung of man and its irregular appearance within the limits mentioned is not at present clear. It is possibly becoming vestigial in man, as its variations would suggest. We have named it the subapical, and in metal casts and by single bronchial fillings with lipiodol and by inflation have shown its distribution to be to the mesial, posterior, and lateral areas of the lower lobe between the apical and posterior basal segments.

Commentary

With the realization of its varied location and the recognition that the other segmental bronchi are constants, the bronchial tree can be described with the surety of ordinary anatomical description.

This dissertation cannot be suggested as detracting from the work of Ewart, who must have devoted many years to his investigations. Alone, and with crude instruments and materials, he described fully the bronchial tree even to its minute branches. Increasing experience of later investigators has confirmed the general accuracy of this master of bronchial anatomy.

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The eighth annual report of the National Birth Control Association (president, Lord Horder), with which is now incorporated the Birth Control International Information Centre, the Birth Control Investigation Committee, and the Society for the Provision of Birth Control Clinics, points out that the amalgamation last spring has left the N.B.C.A. as the only central birth control organization apart from the Society for Constructive Birth Control. The chairman and secretary gave evidence before the Interdepartmental Committee on Abortion, a memorandum having been previously sent in. The medical subcommittee, under the chairmanship of Mr. A. C. Palmer, completed another year of active work, and among leaflets issued was one entitled "Services to Private Practitioners by the Medical Subcommittee of the N.B.C.A." A Scottish Advisory Committee was formed in 1938 and a number of new branches were set up in England and Scotland; some of them have already opened clinics. Early last spring a move was made to new and larger headquarters at 69, Eccleston Square, London, S.W.1. A conference of all branches, held in London before the annual meeting, was so successful that this will now be an annual event. Out of the 409 maternity and child welfare authorities in England and Wales 246 have now taken action of one sort or another under the Ministry of Health memoranda. Of these 246, seventy-nine now have post-natal gynaecological or birth control clinics; 113 refer cases to voluntary or municipal clinics, to hospitals, or to private practitioners; and thirty-eight make grants or lend premises, or do both, to voluntary clinics. Some take action in more than one of these ways.

TWO CASES OF PICK'S DISEASE STUDIED WITH THE AID OF KYMOGRAPHY

BY

G. L. S. KONSTAM, M.D., M.R.C.P.

Physician to the West London Hospital, with Charge of the Cardiographic Department

AND

FRANKLIN G. WOOD, M.B., D.M.R.E.

Radiologist to the London Chest Hospital and the German Hospital, Dalston

(WITH SPECIAL PLATE)

The following two cases of Pick's disease (chronic constrictive pericarditis) were considered worthy of publication, not only because of their comparative rarity, but because opportunity was afforded of studying them by kymography. The first case is of particular interest, as kymograms were taken before and after operation.

Our knowledge of this syndrome and its treatment by pericardial resection has been considerably extended by Paul D. White (1935), whose St. Cyres Lecture summarized his study of fifteen personal cases. The salient feature met with is fibrous or callous thickening of the pericardium, which by gripping the heart in an unyielding envelope prevents normal diastolic filling and leads to what has been termed "inflow stasis." The syndrome occurs in both sexes, and its onset is more usual in early than in middle life. The aetiology is often obscure, but there may be a past history of pneumonia, tuberculosis, polyserositis, pleurisy, and acute pericarditis. It is noteworthy that in none of White's series was there any evidence of a rheumatic infection.

The main symptoms are dyspnoea and swelling of the abdomen; the signs are similar to those observed in chronic congestive heart failure, with the important exceptions that the heart is not usually enlarged and evidence of valvular disease is absent. The jugular veins, and often the arm veins, are greatly engorged, the liver is enlarged but not tender, and ascites develops which is out of all proportion to any oedema that may be present in the extremities. The blood pressure and pulse pressure are below normal, and pulsus paradoxus is often found. Normal rhythm is usual, but in four of White's cases, and in one here described, there was auricular fibrillation.

X-ray Appearances

The heart shadow is normal in size and shape, or moderately enlarged. Calcification of the pericardium is frequently present, but its absence does not exclude the diagnosis; congestion of the pulmonary vessels and enlargement of the supracardiac shadow are also met with. On screen examination the normal heart pulsations are greatly reduced, and may even be absent, but these findings are more accurately shown by the modern method of kymography. An electrocardiogram may show low-voltage flattening or inversion of the T waves in Lead I or II, or in both leads. When inverted the T wave is coronary in Type. Low-voltage QRS waves are also commonly found.

Without surgical treatment the prognosis is hopeless, the disease usually terminating fatally within a few years. Resection of the pericardium by operation may, on the other hand, lead to restoration of normal health.

Case I: Pick's Disease of Unknown Origin

A girl aged 9 attended the out-patient department at the West London Hospital in February, 1932, to 1933 suffering

from bronchitis. In 1936 she was admitted to the hospital under Dr. Sydney Owen. During the intervening three years she had had chicken-pox, mumps, measles, and bronchitis.

The girl was very debilitated and thin. The tonsils were much enlarged, and their crypts were full of carious debris. The lips were slightly cyanosed and the cervical veins engorged even in the upright position. The pulse was regular, rate 94, and the blood pressure 102/78. The heart was not clinically enlarged, and Broadbent's sign was absent. No murmurs were present, although a harsh systolic murmur had been noted before admission to hospital. A few rales were heard over the lung bases. The abdomen was distended and the umbilicus everted, but there were no signs of ascites. The liver was much enlarged, firm, and not tender. There was no oedema of the extremities. The urine contained no albumin or sugar. The cardiac impulse was poor over all chambers, but the mobility of the heart was unimpaired. There was considerable pulmonary vascular engorgement. Four examinations of the sputum were negative for tubercle bacilli, and the Mantoux reactions (1 in 10,000 and 1 in 1,000 dilutions) were negative. Blood Wassermann and Kahn reactions were negative. A blood count on September 14, 1936, gave: red cells, 4,400,000 per c.mm.; haemoglobin, 88 per cent.; white cells, 17,000 per c.mm.; colour index, 1.1. Anisocytosis was present. An *x*-ray examination made on August 25, 1936, by Dr. H. W. A. Post showed that the heart was not obviously enlarged. There was a prominence of the left border in the pulmonary artery region. A deposit of calcium was visible in the pericardium in the anterior and lateral views. The lung fields were clear.

During the five-weeks observation in hospital her condition improved somewhat, but slight pyrexia up to 99.6° continued until the time of her discharge. Three months later she was able to return to school; owing, however, to swelling of the abdomen and shortness of breath she soon had to be withdrawn. In January, 1938, the father wrote that she could only move about with difficulty in her room, and, apart from this, had to be wheeled around in a push-chair. Frequent cough added to her difficulties.

On January 24, 1938, at the age of 9¾, she was readmitted to the West London Hospital. She was mentally backward and shy. Her face was puffy, and the veins in the neck were engorged when she was in the sitting position. Moderate orthopnoea was present. The pulse rate was 100, and pulsus paradoxus was absent. The apex beat was in the fifth space in the mid-clavicular line, and systolic retraction was visible in this region. The mitral first sound was accentuated, but no murmurs were present. The percussion note at both lung bases was impaired, owing to the high position of the diaphragm. The abdomen was grossly distended from ascites and the lower border of the liver was three inches below the costal margin. There was no oedema of the feet. On investigation the circulation rate (3 c.cm. 20 per cent. decholin solution), antecubital fossa to tongue, was 20 seconds (normal 9 to 16 seconds).

From a pre-operative *x*-ray examination made on January 11, 1938, it was observed that both domes of the diaphragm were elevated, causing the heart to lie more transversely; the deposits of calcium had increased and were greater on the anterior, left lateral, and inferior aspects of the heart. Congestion of the pulmonary vessels was visible. A kymogram (Plate, Fig. A) was taken the same day and the following appearances were noted: right border, pulsations almost absent; left border, aortic pulsations were not clearly defined. Abnormal movements were visible in the prominent middle arc region and slight movement in the upper ventricular area. The apex of the left ventricle, which was seen to be encased in a thick layer of calcium, was quite immobile.

OPERATION

On February 7, 1938, paracentesis abdominis yielded fourteen pints of straw-coloured fluid. Paracentesis was repeated two weeks later, and another ten pints were drained. On February 23, 1938, transternal pericardiectomy was performed by Mr. J. E. H. Roberts, assisted by Mr. A. Simpson-Smith. Details of the surgical aspects of the case are to be published later by Mr. Roberts. The visceral pericardium was thickened and calcified, and was in some places firmly adherent to the myocardium; in other places it was more easily separated. It was incised and stripped off the anterior and left lateral aspects of the heart, in the process of which both pleural cavities were accidentally opened. Over the auricles the pericardium was more densely adherent, and owing to this and the patient's poor condition it was deemed advisable to terminate the operation as soon as possible.

POST-OPERATIVE HISTORY

Dr. R. G. Waller examined a section of the pericardium and found that it was greatly thickened (5 mm. in its thickest area) by an increase of collagenous and fibrous tissue; numerous calcareous plaques were present. There was no histological evidence of tuberculosis. Before the patient was returned to bed sufficient air was evacuated from both pleural cavities, by means of a pneumothorax apparatus, to leave slightly negative pressure. A drip blood transfusion was given, and during twenty days of a stormy post-operative period an oxygen tent was used. A week after the operation twelve ounces of ascitic fluid were aspirated from the abdomen, but since then there has been no further tendency for the fluid to reaccumulate and the abdomen has remained flat. Ten days after operation the circulation rate had slightly improved—19.5 seconds from antecubital fossa to tongue. Subsequently convalescence was uneventful, and when examined seven months after operation the patient had gained 8 lb. in weight, was leading a normal life, and was able to run round the ward without becoming short of breath; the distension of the cervical veins had disappeared.

Serial electrocardiograms (Figs. 1 and 2) were taken. Before operation (Fig. 1) the QRS and T waves were of low voltage in all leads. Three weeks after operation the T waves in Leads I and II became negative, but seven months later (Fig. 2) the T waves in the first two leads again became positive, and were of much higher voltage than in the pre-operative period. The QRS complexes in the limb leads were also much larger. Notching of the P waves in Lead II and right axis deviation resembled the findings in mitral stenosis.

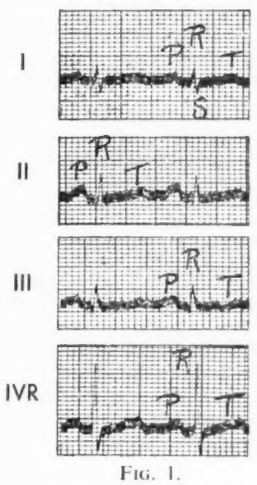

FIG. 1.

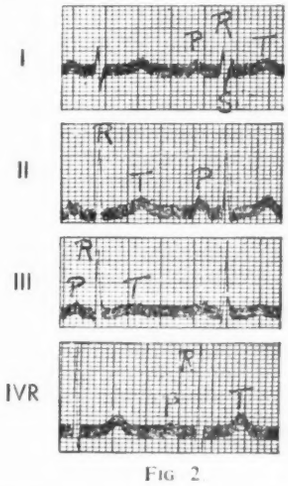

FIG. 2

FIG. 1.—Case I. Electrocardiogram (pre-operative) taken on January 11, 1938. Normal rhythm, rate 93 per minute. The QRS and the T waves in the limb leads, low voltage. The P waves in Lead II, large and bizarre. Notching of the T waves in the chest lead (IV R).

FIG. 2.—Case I. Electrocardiogram taken on September 16, 1938, seven months after pericardial resection. Slight right axis deviation has developed. Higher-voltage QRS and T waves in all leads. P waves in Lead II, notched.

X-ray examination on August 16, 1938, six months after operation, showed that the diaphragm was no longer elevated, but despite this the heart shadow was larger: the transverse diameter was 12 cm., which represented an increase of 1 cm. over the pre-operative measurement. Calcium deposits could now only be seen on the inferior aspect of the heart. The

prominence in the region of the pulmonary arc persisted, but a barium swallow examination, in the right oblique position, showed no enlargement of the left auricle.

A kymogram (Fig. 3) was taken on September 28, 1938, seven and a half months after operation. Pulsations in the right border were still minimal. The left border showed great increase in the pulsations, especially in the apex of the left ventricle, where they had been previously absent. The wave form, which did not conform to the normal ventricular pattern, is shown in the tracing; this may be due to unequal decompression.

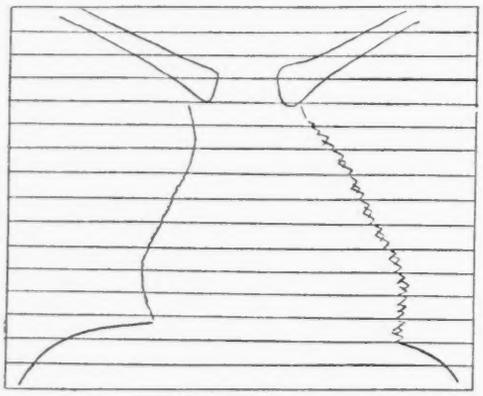

FIG. 3.—Case I. Tracing of a kymogram taken seven and a half months after pericardial resection. Compared with Fig. A (Special Plate) the pulsations have reappeared at the cardiac apex, and are more obvious over the left border of the heart.

Case II: Pick's Disease; Pulmonary Tuberculosis; Auricular Fibrillation

A man aged 52 was admitted to the East Ham Memorial Hospital on March 23, 1937. There was a history of pneumonia and pleurisy six years previously, and since then he had complained of slight cough, increasing shortness of breath, and night sweats. For two weeks before admission his feet and abdomen had begun to swell.

On examination his nutrition was seen to be very poor; the eyes were rather prominent, but the thyroid was not enlarged; he was dyspnoeic and orthopnoeic. The veins of the neck, in the sitting position, were distended up to the angle of the jaw. The pulse was completely irregular in time and volume, and the rate was 100 per minute; the blood pressure was approximately 98/65. The apex beat could not be felt, but the left border of cardiac dullness was half an inch external to the mid-clavicular line, and the cardiac dullness did not shift with movement. The heart sounds were distant. There was flattening of the chest at both apices, and below the right clavicle the percussion note was impaired and crepitations were present; in addition rhonchi were heard over both lungs. The abdomen was tense and distended; the lower border of the liver could be felt two fingerbreadths below the costal margin, and there was dullness over the flanks. There was moderate oedema of the feet and ankles.

On admission the patient's temperature was 99°, but the next day it fell to normal, and remained so during the six weeks he was kept under observation. The urine contained a trace of albumin. The circulation rate was 25 seconds from the antecubital fossa to the tongue. An electrocardiogram (Fig. 4) showed auricular fibrillation with flattening of the T wave in Lead I, negative T waves in Leads II, III, and in the chest lead (IV R). Tubercle bacilli were present in the sputum. The Kahn reaction of the blood was negative.

X-ray Appearances.—Anterior and lateral views were taken of the chest and also a kymogram. In the anterior view the trachea and upper part of the mediastinum are displaced to the right. The heart is normal in size, but slightly irregular in outline, especially on its left border. An irregular deposit of calcium appears to be situated chiefly on the left side and inferior aspect of the heart. The upper part of the right lung is opaque owing to thickening of the pleura. An area of translucency below the clavicle suggests the presence of cavitation. A deposit of calcium can be seen in the lung in this region. The middle and lower zones were comparatively clear. The right costo-phrenic angle is blocked by thickening of the pleura. Mottling is present in the left lung in the upper and middle zones. The left costo-phrenic angle is partly blocked by pleural thickening. In the lateral view a

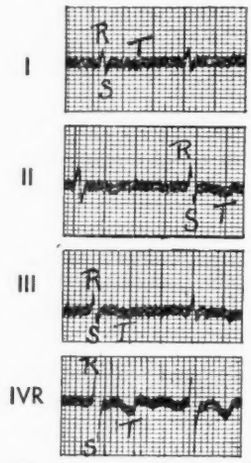

FIG. 4.—Case II. Electrocardiogram taken on May 4, 1937. Auricular fibrillation, rate 94 per minute QRS waves in Leads I and III, low voltage. T in Lead I, flat. T in Leads II and III, and in the chest lead (IV R), negative. Digitalis was not being administered at the time of examination.

marked deposit of calcium can be seen on the inferior border of the heart and also anteriorly where it extends in a continuous sheet downwards from the internal aspect of the manubrium sterni.

A kymogram was taken, but owing to the presence of dyspnoea it was necessary to make a record during quiet respiration. There were two respiratory phases during the exposure time of three seconds, the heart moving to the right during expiration and to the left during inspiration. The normal pulsations were absent except at the apex of the left ventricle, where small movements could be made out.

With rest, digitalis, and salyrgan injections moderate improvement occurred, but owing to the evidence of active tuberculosis in the lungs pericardial resection was not performed. The patient was subsequently discharged from hospital, and died in his home on July 12, 1937. No post-mortem examination was made.

Summary

Two cases of Pick's syndrome which were investigated by radiology, including kymography, are described. Case I, of unknown origin, was studied before and after operation. Case II, which was due to tuberculosis, was unsuitable for surgical treatment.

Kymography was found to be of value in showing the limitation of heart movement and as providing a record of the changes following surgical treatment.

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The Ministry of Labour has published a new edition of the pamphlet on *Dentistry*, which is No. 14 of the series compiled by arrangement with the Incorporated Associations of Headmasters and Headmistresses of Public Secondary Schools. The pamphlet sets out in detail the qualifications and training required and the prospects open to boys and girls of secondary school education wishing to make a career in dentistry. It may be purchased from H.M. Stationery Office or through any bookseller, price 3d.

THE JUVENILE FORM OF THE ADRENO-GENITAL SYNDROME

BY

J. S. RICHARDSON, M.A., M.B., M.R.C.P.

Medical Registrar, St. Thomas's Hospital

AND

W. R. S. DOLL, M.B., B.S.

House-physician, St. Thomas's Hospital

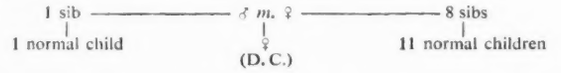
(WITH SPECIAL PLATE)

The adreno-genital syndrome is rare when it occurs under the age of puberty. The chief characteristics are a pseudo-hermaphroditism with masculinization in the female in the presence of a tumour or hyperplasia of the suprarenal cortex. The child may be advanced for her age, both in body and mind, but does not show a true precocity, as menstruation never occurs.

Case Record

D. C., aged 6 years 11 months, was admitted to St. Thomas's Hospital on April 4, 1938, under the care of Dr. H. Gardiner-Hill. Her parents complained that she had had a profuse growth of pubic hair since the age of 2½ years, and that the genitalia had been abnormally developed since 1½ years old.

Family History.—No other sexual abnormalities have been reported in the family. The parents are not related and have no other children ; the mother has eight siblings, who between them have eleven normal children ; the father has one sibling with one normal child.



Patient's History.—Labour was normal ; her weight at birth was 7½ lb. and at 1 year 21½ lb. She sat up and cut her first teeth normally, began talking before 1 year, and walked at 14 months. She had pneumonia at 5 years and whooping-cough at 6 years. She grew normally during infancy, weighing 31½ lb. at 22 months. Rapid growth took place between 2 and 4 years, when she was the size of normal children aged 7 : since then the rate of growth has slowed down. The permanent teeth began to appear at 5 years.

Sex.—The external genitalia appeared normally female at birth. Suspicions were first aroused at about 6 months, when the mother noticed that the vagina was very small. The clitoris was observed to be large at 18 months, but may well have been abnormal before ; it grew rapidly till 4 years, but not disproportionately afterwards. Pubic hair was first noticed at 18 months, and grew rapidly thicker ; it had been unchanged since the age of 6. Axillary and facial hair appeared at about 5 years, the voice became gruff at 3 years, and facial acne appeared at 4 years. There had been no vaginal haemorrhage.

Personality.—She was mentally bright and worked with slightly older children at school. She was energetic and played games at school. Her favourite pastimes were jigsaw puzzles and constructive games. She read the *Children's Encyclopaedia*. She played with girls and not boys, with dolls and not "teddy-bears." Her parents were convinced that she was a girl. She had never been observed to masturbate.

Examination.—When examined on April 4, 1938, she appeared to be a healthy girl who was much too big for her age (Plate, Fig. 1). Her height was 55¾ inches (normal, 46 inches), weight 78 lb. (normal, 49 lb.), and body/leg ratio 28¼/27½ (normal, about 1 : 1). There was no abnormal obesity. The hair was brown and the eyes green-brown. There was a marked growth of hair on the upper lip, noticeable from the end of the bed, and well-developed side-whiskers. The hair at the nape of the neck was V-shaped—that is, female. The pubic hair was thick and curly, with a straight upper border, and resembled that of a fully developed woman. Hair was thick in the axillae and well marked on forearms and legs. The voice was deep and husky. The breasts were undeveloped, as were the nipples. The abdomen contained no palpable tumour. Per rectum what was thought to be a cervix was felt. Heart, lungs, and central nervous system were normal. There was a large hypospadic phallus about one inch long, with rudimentary foreskin. The labia joined in the midline except just behind the phallus, where they parted to leave a small hole that was the urethra. No vagina was found.

SPECIAL INVESTIGATIONS

Stage of Development.—Mr. Martin Rushton reported that the teeth were like those of a 10-year-old child. Radiographs of the wrist showed development corresponding to about 12 years ; the pisiform was present. Radiographs of the knees revealed closing epiphyseal lines, the upper end of the tibia corresponding to about 14 to 15 years and the lower end of the femur to about 17 to 18 years.

Metabolism.—The basal metabolic rate was −28 per cent. (compared with normal female aged 7). The blood sugar amounted to 0.104 mg. per cent. ; one hour after 50 grammes of glucose by mouth it was 0.113 mg. per cent.

Endocrines.—A radiograph of the skull showed a normal sella. The Aschheim-Zondek reaction in the urine was negative. Urinary androgens (estimated by Mr. Warren at the Cancer Hospital Research Unit) amounted to 73 mg. per litre (normal, 2 to 12).

Abdomen.—Straight radiographs showed only calcified glands, and an intravenous pyelogram revealed normal and normally placed renal pelves. A barium meal showed a normally situated stomach. Perirenal injection of air was attempted in the hope of being able to outline the suprarenals. No useful result was obtained.

The child's behaviour while in the ward was that of a normal girl of 7. She was discharged on May 14, 1938, and urine was collected from which the androgens could be extracted and analysed. She was readmitted on July 14.

OPERATION

On July 25 laparotomy was performed by Mr. Maybury. He reported that the left suprarenal gland was normal and the right impalpable. The ovaries were large for a child of 7, and contained many small cysts ; a piece was removed from each for pathological examination. Dr. Bamforth reported : "Each shows numerous primordial follicles and dilated follicular cysts. No evidence of the presence of testicular tissue." The uterus was a small rudimentary organ attached to the back of the bladder.

Operation was performed on August 15 by Mr. Williams. The right suprarenal was removed completely in one piece ; it was three times the normal size (weight, 17 grammes). Microscopy revealed cortical hyperplasia, with the ponceau-fuchsin stain showing red granules in large quantities, mostly in the area between cortex and medulla, but also throughout the rest of the cortex. Estimation of the urinary androgens seven days after operation showed an excretion of 125 mg. per litre. The patient developed bronchopneumonia, and died on September 2, eighteen days after operation.

Post-mortem Report

The post-mortem examination, performed by Dr. Derry, showed right-sided bronchopneumonia and basal collapse. The left suprarenal was markedly hypertrophied, weighing 25 grammes. Examination of the sex organs confirmed the laparotomy findings ; the vagina was imperforate. The pituitary and thyroid were macroscopically normal. The microscopical examination, for which we are indebted to Dr. Derry, disclosed that the thyroid gland was normal. The ovaries are reported upon above. The left suprarenal (weight 25 grammes) revealed hyperplasia of cortex, with marked

ponceau-fuchsin staining reaction throughout the cortex. Serial sections of the pituitary gland showed no basophil adenoma. The eosinophils appeared to be increased in number in all sections. Some sections were stained by the method used by Hawking (1936) for differential pituitary-cell counts. These showed that the basophils were present only in very small numbers and that the eosinophils were prominent.

Discussion

The clinical features of this case can be summarized as giving a picture of a girl of 7, of feminine but precocious mentality, with the physical development of a child of 12. Her voice was deep and husky; there was a tendency towards facial acne vulgaris and hirsutism (Plate, Fig. 2); and her external genitalia were abnormal, with a hypertrophied clitoris and absence of the vaginal orifice (Plate, Fig. 3). These abnormalities were first suspected when the child was only 6 months old. She is thus an example of pseudo-hermaphroditism, with suprarenal hyperplasia, or the juvenile form of the adreno-genital syndrome.

Grollman (1936) could find no more than nineteen juvenile cases in females in the literature, and Young (1937), in an extensive study of the subject, collected only twenty-three female pseudo-hermaphrodites with suprarenal hyperplasia, and described four more cases in detail. These four had been treated by himself. Broster, Vines, *et al.* (1938), out of thirty-three cases of this syndrome on whom adrenalectomy was performed, had only five cases in the group occurring before puberty; and Cahill (1938), in a recent paper reviewing thirty-five cases, makes no mention of any of them having occurred in females before puberty.

One of the two cases described by Meyler and Hommes (1937) began at the age of 10, but the patient was quite normal up to that age. It is thus clear that this condition is rare, especially when it is remembered that a case was described by Grecchio as long ago as 1865, in which "extensive hypertrophy of the adrenals was found at necropsy."

The work of Greene and Ivy (1937) is of particular interest when this case is considered. They found that the injection of testosterone propionate into a pregnant rat at various stages in the pregnancy produced definite changes in the female offspring. When given early, a hypospadias at the base of a hypertrophied clitoris was produced with an imperforate vagina, represented by a crescentic fold of mucous membrane. This description would be an accurate one of the genitalia in our case.

Hain (1936) had procured similar changes, and Dantchakoff (1937) was successful in producing agenesis of the vagina and intersexuality with testosterone injected into the amniotic sacs of embryo guinea-pigs. The exact significance of these findings is not clear, but their importance is undoubted, as they are the nearest approach we have so far attained to the experimental production of pseudo-hermaphroditism in animals. When we turn to the investigations carried out on our case there is special significance in the correlation of a strongly positive ponceau-fuchsin staining reaction in the suprarenals and the excretion of a great excess of androgens in the urine.

The presence of large amounts of steroids, with male hormone activity, in the urine of patients suffering from suprarenal hyperplasia or neoplasia has been observed by several workers, notably Burrows *et al.* (1937), Broster and Vines (1937), Butler and Marrian (1937), and Callow (1938). However, our case is unusual in that there was a marked post-operative rise in the urinary androgens instead of a fall. This rise is clearly of considerable importance, as it shows that it is extremely improbable that this patient would have been benefited by unilateral adrenalectomy. Grollman (1936) suggests that the ideal operation would be to shell out the medulla and juxtamedullary zone on both sides. This suggestion is based on his belief that the syndrome is caused by an abnormality of the juxtamedullary zone, which, acting quite independently of the rest of the cortex, produces hormones with androgenic activity. It is possible, however, that when the hyperplasia is bilateral some other factor is active, the suprarenal cortex reacting only secondarily. The anterior lobe of the pituitary may provide the primary stimulus, in which case unilateral or partial bilateral adrenalectomy would be illogical.

Summary

A typical case of the juvenile type of the adreno-genital syndrome is reported.

The points of special interest which are briefly discussed are the early onset of recognizable signs, the correlation of a strongly positive ponceau-fuchsin staining reaction and an increased excretion of urinary androgens, and a post-operative increase in the excretion of urinary androgens.

It is a pleasure to express our thanks to Dr. H. Gardiner-Hill for his encouragement and permission to report this case; and also to Dr. F. L. Warren for estimating the urinary androgens.

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ACOUSTICAL TESTS

The National Physical Laboratory has issued a booklet on tests and measurements undertaken by the Physics Department Acoustics Division which outlines work done recently on the measurement of sound and the application of acoustics to industry and everyday life. These activities embrace the testing of acoustical instruments such as microphones, loudspeakers, telephone receivers, noise meters, gramophone pick-ups, hearing-aid instruments, otological tuning-forks; the measurement, analysis, and mitigation of noise; tests of acoustical properties of materials; sound insulation of building structure; acoustics of buildings, etc. Each of these subjects is discussed briefly, the method of testing is described, and the range of tests is set out. This is followed by a table of fees which may be charged for any individual test. The details of each subject are rather highly technical and would be more familiar to physicists than to most medical men, but the National Physical Laboratory has already investigated many problems in which the medical profession is interested, such as the reduction of noise from aero-engine test beds, the reduction of noise in aircraft, ships, and trains, the noise of motor vehicles and of warming devices, the transmission of sound along water pipes, and the acoustical properties of sound-deadening materials.

SINGLE LARGE CYST OF THE LUNG SIMULATING A HIGH-PRESSURE PNEUMOTHORAX

BY

E. H. HUDSON, M.B., M.R.C.P.

Assistant Physician, West London and London Chest Hospitals

(WITH SPECIAL PLATE)

Continental and American literature contains a number of references to this condition, but I am able to find very few in our own. Possibly, therefore, some cases have been overlooked and a mistaken diagnosis of spontaneous pneumothorax has been made. If the cyst contains fluid or is infected the condition may be mistaken for effusion or empyema (Roberts, 1937–8). The following case, in which a lung cyst occurred in a child, may be of interest.

Case History

The patient, who was born on April 1, 1936, was a first child, and labour was normal, lasting nine and a half hours. He was a good colour, and progress was normal until the age of 6 weeks. Up to this time the only abnormality noticed was a curious clucking noise he made; but, as the nurse said, "They do make funny noises." He was circumcised successfully under an anaesthetic. When 6 weeks old he was having his evening feed (at 6 p.m.) from the breast, when he stopped feeding and started to scream and to claw at his mother, "as if he was frightened to death. He would not stop screaming, and shortly became dark-coloured, and towards the end was ashen cold and sweaty."

He was seen by his doctor at 7.45 p.m., but as he was sleeping was not examined. He was successfully fed at 11 p.m., and slept fitfully that night. The next day he cried more than usual, and after he had been at the breast a little while he struggled and became cyanosed, "as if fighting for his breath." The mother was now thoroughly alarmed, and took him to the clinic, where he was "sounded." Nothing abnormal was discovered, and the mother was reassured. Since the difficulty seemed to be in sucking the breast, he was weaned, and was bottle-fed from now on.

For two weeks he seemed to be normal, but then had a minor attack and was again taken to the clinic. He was referred to the West London Hospital with classical signs of a pneumothorax. The *x*-ray appearances were also at first mistaken for spontaneous pneumothorax, but the absence of the pulmonary knuckle, the rounded mediastinal margin, and the filaments of lung tissue in the costo-phrenic angle and at the apex aroused suspicion. A radiograph was taken with a less penetrating ray (Plate, Fig. 1), which showed clearly the pulmonary remains at the apex and the base. The diagnosis was therefore changed to "lung cyst, probably of the middle lobe," and the possible treatment was discussed with my colleagues. Unfortunately a congestive attack forced the issue, and a Chandler lipiodol cannula and trocar was thrust in the fourth space just lateral to the nipple line. This relieved the symptoms immediately; in a few moments the child was a normal healthy pink and laughing contentedly.

Fig. 2 (see Plate) shows the danger, for now we had a leaking cyst, a partially expanded lung, and a pneumothorax. The anticipated result came in a few hours. The child coughed, the cannula was withdrawn from the cyst by the separation of the pneumothorax, the cyst blew up again, and the child nearly died. A Morland pneumothorax needle, kept in readiness for this emergency, was quickly thrust through the chest wall into the cyst, and again in a few moments the child returned to normal. Mr. Harvey Jackson operated immediately. On opening the chest in the fourth interspace in front the cyst presented at the opening like a purple balloon. It was sutured to the sides of the incision by a continuous suture, a drainage tube being sewn into the cyst and a one-way valve fitted to help the respiration and allow drainage. For the next three weeks the child appeared to progress satisfactorily (Fig. 3), but unfortunately the cyst became infected, an empyema formed between the lung and the mediastinum, and the child developed bronchopneumonia and died.

POST-MORTEM EXAMINATION

Owing to the adherence of the lung it was extremely difficult to remove from the thorax, and consequently was much damaged. It was not possible to say exactly whence the cyst arose. The upper and lower lobes of the right lung were normal; although there was a small middle-lobe bronchus it was impossible to locate the middle lobe accurately. A fragment of the cyst wall showed columnar-celled lining.

Commentary

Since small infants suffering from diseases of the chest are seldom seen by those interested in this group of diseases, it should be remembered that, although these cases are rare, spontaneous pneumothorax is also exceedingly rare in infancy, and this possible alternative diagnosis should be considered very seriously in every case suggesting a suffocative or non-absorbing pneumothorax.

Two courses of treatment appear to be open: (1) a two-stage operation on the lines of that performed for drainage of a lung abscess, with fixation of the pleural layers and marsupialization of the cyst at a second operation; (2) total removal of the cyst or pneumonectomy.

The dangers of the condition are: (1) Faulty diagnosis and treatment as for a pressure pneumothorax, by the insertion of a trocar and cannula: the danger of this procedure is adequately illustrated in the above case history. (2) Infection of the cyst, with empyema formation and bronchopneumonia; this again is well illustrated in the present case. The majority of cases recorded seem to have ended fatally because the true diagnosis was not apparent. They have mostly been treated as cases of pressure pneumothorax and have succumbed to a congestive attack, due no doubt to the air leaking from the cyst into the pleural cavity. The ideal treatment is total removal of the cyst or even pneumonectomy.

I am indebted to Dr. Sidney Owen, who referred the case to me, for the details of the history; and to Dr. H. Post for his help with the radiographs.

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Last year the League of Nations, in accordance with a request from the Chinese Government, collaborated with the Chinese health authorities in widespread epidemiological work, particularly for the prevention of cholera, small-pox, typhus, and malaria, among the civil population in North, Central, and South China. For this purpose ten senior medical officers, with the necessary transport, laboratory equipment, and drugs, were maintained by the League in China throughout the year. At the last Assembly of the League the Chinese delegation urged that this valuable work should be continued, and the Assembly voted a further sum of 1,500,000 Swiss francs to continue the technical assistance to China, particularly with reference to the control of epidemics. In furtherance of this decision Dr. Melville D. Mackenzie of the League of Nations Secretariat is immediately proceeding to China by air as the Secretary-General's representative. He will discuss with the Chinese Government at Chungking and with the Epidemic Commission the lines upon which work should be carried out during the present year and the modifications to be introduced in the light of last year's experience.

ENTERIC INTUSSUSCEPTION DUE TO INVAGINATION OF MECKEL'S DIVERTICULUM

BY

MILROY PAUL, M.S., F.R.C.S., M.R.C.P.

Professor of Surgery, Ceylon Medical College; Surgeon, General Hospital, Colombo

(WITH SPECIAL PLATE)

An intussusception produced by the invagination of a Meckel's diverticulum is a rare condition; in view of this the case reported below will no doubt be of interest. The earliest recorded case (1846) is that of a patient aged 36 who died from intestinal obstuction and peritonitis. The specimen from that case, showing a gangrenous ileo-colic intussusception with a diverticulum of the ileum at its apex, is preserved in St. Bartholomew's Hospital Anatomical Museum. Harkins (1933) made a careful study of the literature on the subject and collected the records of 160 cases, and since that time fifteen additional cases have been reported in the literature.

A Meckel's diverticulum which invaginates is one that is free of other attachments. Once the diverticulum has invaginated it will act in much the same way as a pedunculated polyp, which tends to get passed down the lumen of the gut by peristalsis. An enteric intussusception thus started will have the invaginated diverticulum at its apex. Owing to the site of origin of this intussusception being in the lower ileum, it will form a sausage-shaped lump, which if palpable would be felt in the right lower abdomen, contrasting in this respect with the higher position of the lump felt in the ordinary ileo-colic and ileo-caecal intussusceptions. Should the intussusception travel down far enough it will eventually reach the caecum and ascending colon, and will then become an ileo-colic intussusception. The apex hardly ever reaches the rectum in this type of case. Indeed, no case has yet been recorded in which this is definitely stated to have occurred.

Analysis of the Literature

Harkins made a useful statistical analysis of the literature, and the following facts are abstracted from his valuable paper:

> Meckel's diverticulum occurs in 1.3 per cent. of all cases (based on the published reports of 25,149 necropsies, in which special search was made for Meckel's diverticula). Meckel's diverticulum is a factor in the production of intussusception in 2.5 per cent. of all cases of intussusception as judged from the report of cases in the literature; but this figure is too high, as the more usual types of intussusception would not be so likely to be reported. Seventeen per cent. of Meckel's diverticula giving rise to surgical complications do so by producing an intussusception. Out of 114 cases of intussusception due to Meckel's diverticulum there was a tumour at the apex of the diverticulum in twenty-six cases. Seventy-nine per cent. of the recorded cases in which the sex was mentioned were in males. The age incidence in 111 cases is shown in the following table:

Age in years ..	0–10	11–20	21–30	31–40	41–50
Number of cases ..	60	24	15	7	5

Case Report

A male Singalese aged 50 was admitted to the General Hospital on July 14, 1938, complaining of a severe colicky abdominal pain of two days' duration. For the past month he had had slight pain, but had not taken much notice of this. He had vomited several times in the last twenty-four hours, and had developed a persistent hiccup. His bowels had not moved since the onset of pain. The patient appeared older than his stated age, and he had the expression of a man who had suffered severely. He stated that the pain came on from time to time. His pulse was 90 and of fair volume. The abdomen was soft and no lumps were palpable. A rectal examination revealed no abnormality, save for a moderate enlargement of the prostate gland. A rectal tube was introduced, and flatus was observed to escape. The patient, who did not wish to have a surgical operation, was kept under observation. He spent a restless night rolling about in pain. He vomited repeatedly, at least ten or twelve times, and the hiccup continued, coming on every half-hour. His pulse remained at 90.

The next day the symptoms were much the same. Examination of the urine revealed nothing abnormal, and the systolic blood pressure was 140. That afternoon the vomit was like coffee grounds, and there was a suspicion of a ladder pattern observed on inspection of the abdomen. An enema gave a good result, with passage of much flatus, and the patient felt better. He spent a quiet night and passed a stool in his bedclothes early in the morning. On examination it was noted that with the onset of each pain, which now recurred every few minutes, a distinct ladder pattern could be seen clearly through the abdominal walls. It was evident that the patient had an organic obstruction of the small intestine. Even at this stage no lump was palpable in the abdomen. The patient now consented to have a surgical operation.

Operation.—The abdomen was explored through a midline infra-umbilical incision under spinal anaesthesia. There was no noticeable excess of intraperitoneal fluid. The small intestines were greatly dilated and an enteric intussusception six inches long was found in the lower ileum. This was readily reduced, and the gut was found to be viable and of good colour. On inspection a cone-shaped orifice, the diameter of the tip of the little finger, was seen on the ante-mesenteric border of the gut at what had been the apex of the intussusception. This was recognized as the base of an invaginated Meckel's diverticulum—a view that was confirmed by finding on palpation a sausage-shaped mass in the lumen of the gut as thick as a finger, extending from this point downwards for four inches. Attempts to reduce the inversion of the diverticulum were of no avail, so it was decided to resect the affected portion of small intestine. Six inches of ileum were resected and an end-to-end anastomosis done. The patient made a good recovery till the fifteenth day after operation, when the wound broke down at two points and pus was discharged, followed by the escape of yellow frothy small-intestine fluid. These fistulae gradually closed by the fifty-fourth day, and the patient left hospital with his wound soundly healed on September 28, 1938.

Description of Specimen removed at Operation

The resected portion of intestine was opened along the line of its mesenteric attachment. The inverted Meckel's diverticulum, four inches long, was hanging like a polyp in the lumen of the gut (see Plate). The tip of the invaginated diverticulum was bulbous, and was plum-coloured with congestion. There was no tumour at the apex of the intussusception. This was confirmed by a histological section.

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The Royal Sanitary Institute (90, Buckingham Palace Road, S.W.1) has published as a pamphlet, entitled "The Hygienic Treatment and Disposal of Offal and By-products in Abattoirs," the seventeenth Benjamin Ward Richardson Lecture by Mr. John Austin. The Trust under which these lectures are given was founded by the Model Abattoir Society in 1922 as a memorial to its founder, Sir Benjamin Ward Richardson, M.D., F.R.S. On the dissolution of the society in 1935 the management of the Trust was taken over by the Royal Sanitary Institute.

Clinical Memoranda

Progressive Streptococcal Ulceration

(WITH SPECIAL PLATE)

Progressive streptococcal ulceration, as opposed to progressive gangrene, appears to be a rare condition. Langston (1938), in recording a single case, states that he could find no reference to the subject in English literature. He quotes an article by Meleney (1935) describing six cases seen in America. Meleney in that article also comments on the lack of literature. It is so unusual in these days to find any subject in surgery which has not been repeatedly described and discussed that I am encouraged to bring forward the somewhat imperfect records of two patients who have been under my care.

The disease presents a definite clinical picture, which leaves an indelible impression on the memory of everyone in attendance. Following a trivial accidental wound, or, as noted by other observers, an operation, an indolent ulcer develops, which at first does not cause much concern to doctor or patient. Failure to respond to ordinary remedies results in the patient's admission to hospital. The surgeon anticipates rapid recovery with rest and the use of any local application which happens to be popular. A week passes by, and the ulcer shows no sign of healing: a subcutaneous extension may have developed. Bacteriological investigation reveals the presence of a streptococcus. The Wassermann reaction is negative. Various treatments are tried, and all prove equally unavailing. In the neighbourhood of the ulcer small areas of skin become red, soften, and break down, forming secondary ulcers. Months pass by, and a large area of skin is now covered by irregular ulcers, with undermined edges, which tend to spread and coalesce. Constitutional disturbance is still comparatively slight, but pain is increasing and the disease tends to invade deeper structures. Death may eventually ensue from haemorrhage or septic absorption. Meleney's first two patients died. The third recovered spontaneously after an illness of twenty-six months. The other three responded to treatment by zinc peroxide, which he considers specific. Langston thinks that recovery in his patient was expedited by zinc peroxide, after amputation at the shoulder-joint had been performed.

My first patient made a very slow recovery after amputation through the thigh. The second patient's ulcers are now healing after very thorough diathermy coagulation. Until I read Langston's article I knew nothing of zinc peroxide. My colleague Mr. A. R. Banham tells me that he had under his care recently a girl suffering from a similar condition. She recovered after two applications of diathermy.

CASE I

Early in July, 1932, a man aged 48 was struck on the shin by a stone while digging a grave. An ulcer developed, and on August 6 he was admitted to hospital. On admission he had an ulcer with undermined edges on the anterior aspect of the left leg. After three months in hospital the condition seemed to be improving, and on November 11 he was sent to a convalescent home. On December 9 he returned to hospital with an extension of the original ulcer and fresh ones round the knee. A streptococcus was recovered from the ulcer, and the Wassermann reaction was negative. Various treatments were tried, including *x* rays and a course of stabilarsan. On January 11, 1933, the ulcerated area was thoroughly curetted and a plaster cast applied. On February 23 an abscess was opened on the inner side of the knee. In May there were signs of involvement of the knee-joint. On May 19 amputation was performed through the thigh. Examination of the amputated limb showed disorganization of the knee-joint. Healing of the amputation wound was extremely slow, but eventually took place.

CASE II

On January 8, 1938, a man aged 28 fell and cut his left knee on a metal road stud. The wound was sutured in the casualty department. Sepsis supervened, and he was admitted to hospital on January 20. On admission there was a septic wound, with surrounding oedema, on the anterior aspect of the left knee. The patient's temperature was raised on admission, but with the administration of proseptasine fell to normal in the course of a few days. On February 26 an incision was made on the lateral aspect of the leg. On March 7 it was noted that the patient had a spreading serpiginous ulcer, with a raised undermined edge and a yellow sloughing base. On this date a course of *x*-ray therapy was begun. By April 22 he had extensive ulceration affecting the outer aspect of the lower part of the thigh and the upper part of the leg. With still vivid memories of Case I, I carried out a very thorough diathermy coagulation of the entire ulcerated area. After this the ulceration ceased to spread and very slowly began to heal. On June 27 he left the hospital to attend as an out-patient. The ulcers were healthy and were healing well. The condition on November 1 is shown in the excellent photograph (see Plate) by Mr. Vernon Ashford, honorary clinical photographer to the hospital. The original extent of the ulcers is indicated by scarring. The infection was due to a streptococcus, and the Wassermann reaction was negative.

C. C. HOLMAN, M.B., F.R.C.S.,
Honorary Surgeon, Northampton General Hospital.

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Polyarticular Arthritis Treated with Oestrogenic Hormone

(WITH SPECIAL PLATE)

An account of the following case may be of sufficient interest to merit publication.

CASE HISTORY

The patient was a woman bedridden with typical polyarticular arthritis. She had received treatment at a Birmingham hospital for that condition in the early part of 1938, when she was given eight gold injections and also radiant heat. After a month's interval there was no improvement, so a second course of gold injections was begun. She had only one injection of this second course and then developed a severe dermatitis, as the result of which the injections were suspended, but she continued having radiant heat.

In September, 1938, she became crippled and bedridden, and when I was first called to her on September 20 I found a tall, thin, asthenic type of woman, aged 49, weighing 8 st. 3½ lb. She informed me that pain and swelling occurred in the joints of her fingers in December, 1937, and then spread to her feet and knees. I found she had lumps the size of an egg on the dorsum of each hand, also in each popliteal space. Her shoulders were stiff and painful, and she could not raise her arms more than a few inches. She was suffering severely from pains in the lumbar region and along the left sciatic nerve. She was unable to bend her knees on account of the lumps in her popliteal spaces, and was unable to use her hands even for such a simple procedure as cutting bread. Both ankles and big toes were swollen and inflamed. She had not menstruated for six years, and had suffered from hot flushes since her menopause.

In view of her age, the flushes, and that her condition had started as polyarticular arthritis I decided to give her oestrogenic hormone treatment, and on September 22 I began with 50,000 units three times a week intramuscularly. In one week there was considerable improvement, and I thought it would

be interesting to have a photograph taken of her hand (Plate, Fig. 1). From this it will be seen that there is still a considerable dorsal swelling, but the interossei spaces had already begun to fill up and the phalanges showed considerable improvement. She made rapid progress, and in less than a month had gained 9½ lb., and in another month a further 4 lb. Up to date (January 25, 1939) her increase in weight amounted to 1 st. ½ lb. On November 19, 1938, I was able to allow her to resume her work as a cleaner, while I carried on with the treatment. I am enclosing a second photograph, which was taken on January 19, 1939 (Fig. 2).

She is now completely free from pain, flushes have disappeared, joints move freely, and throughout the whole of my treatment no aspirin or liniment or any other form of medication has been used. On December 31, 1938, the patient had a period which lasted three days. As her menstruation had ceased for six years I look upon this as a uterine bleeding due to oestrogenic stimulation, and not a true menstruation. On January 25, 1939, I ceased treatment by intramuscular injections, and am now trying her on stilboestrol by mouth.

Birmingham. I. RADNOR, M.B., Ch.B., B.A.

Treatment of Pneumonia with M & B 693

I have recently in general practice had two cases of pneumonia which, I think, are worth recording, as I believe their course has been materially affected by M & B 693.

CASE I

A woman aged 61 had on October 26, 1938, a sudden onset of pneumonia, with temperature 101°, pulse 130, and respirations 36; there was consolidation of the left base. She was distressed, and complained of severe pain in the left side. As I felt she was in for a stormy passage, and as the nursing facilities at her home were poor, I suggested that she should be removed to hospital, but that the removal should take place within the next two days or not at all. However, the responsibility of the nursing was undertaken by relatives. She was given M & B 693 every four hours if awake, and at the end of three days her pain and distress had disappeared, and although still ill—temperature 99°, pulse 104, respirations 32—she gave no anxiety to her attendants. In five days she appeared to be comfortable, although she had had no apparent crisis. Her temperature was then 98°, her pulse 90, and her respirations 24. M & B 693 was stopped, but was resumed on the tenth day, when she had a slight relapse, which soon subsided.

CASE II

A man aged 51 had on November 15, 1938, sudden severe pain in the right side and a rigor. His temperature was 103.4°, pulse 116, and respirations 38. There was extensive pleurisy and consolidation of the right base and rusty sputum. The question of removal to hospital was considered, but again the nursing was undertaken. M & B 693 was given every four hours whilst awake, and although the patient was distressed and delirious he improved each day, and on the fifth day the temperature was 97.4°, pulse 96, and respirations 28, although delirium and confusion continued. The following day he appeared quite well despite there being no apparent crisis; the M & B 693 was now stopped. On the eleventh day the patient had a relapse, the opposite lung being affected. His temperature was 103°, pulse 100, and respirations 28, but there was no delirium; on the fifteenth day he was well enough. He had two further slight relapses, which I think could have been avoided if a small daily dose of M & B 693 had been maintained.

Although these cases may have taken the same course without M & B 693, it would be against previous experience. The lack of distress after two days, and the disappearance of symptoms without apparent crisis or lysis, are unusual, and suggest that the drug mitigated the course. I should have expected to administer hypnotics, stimulants, and probably oxygen in similar cases, but none was needed. The combination of delirium with a subnormal temperature, in pneumonia, one would see with some apprehension, but when this occurred the patient's condition was excellent and gave rise to no anxiety. The tendency to relapse was perhaps due to leaving off M & B 693 prematurely.

Larger initial doses are advocated, but I think that if a smaller dose is effective in mitigating an attack it is better to avoid the possible toxic effects of the drug and to allow the patient's own defences some part in the conflict.

Stechford. H. G. LANGDALE-SMITH, M.B.

Treatment of Retained Placenta

Retention of the placenta may be a very dangerous complication of labour. There is the immediate risk of death from shock and haemorrhage and, later, danger from puerperal infection. The methods of treatment available are: (1) Credé's manœuvre; (2) injection of the umbilical cord with saline; and (3) manual removal.

Intravenous injection of the umbilical cord is an old method that has recently been revived. The detailed technique is described by Currie (1937). Briefly, it consists in injecting into the umbilical vein 500 c.cm. of saline at body temperature by means of a Higginson syringe. The injection causes the placenta to swell, and through a mechanical action or by stimulating uterine pains haemorrhage is prevented. The placenta may now escape spontaneously or be expelled by Credé's method if the usual tests show that the placenta has been separated from the uterine wall. In a few cases the placenta will still be retained; in these injection can again be attempted, and only if this fails should manual removal be resorted to. I have attempted the method in fifteen cases and the results are here tabulated.

Case No.	Date of Admission	Method of Delivery	Injection of the Cord
1	20/7/37	Normal	Successful
2	5/8/37	"	"
3	5/8/37	"	Failed
4	18/8/37	"	"
5	21/8/37	Willett's forceps	Successful
6	16/9/37	Normal	"
7	11/10/37	"	"
8	9/12/37	"	"
9	18/2/38	R.S.A.	
10	21/2/38	Bipolar version	"
11	26/2/38	Forceps	Failed
12	26/2/38	Normal	"
13	8/3/38	Willett's forceps	Successful
14	5/6/38	Normal	"
15	6/9/38	Forceps	"

It will thus be seen that the method was successful in eleven cases and unsuccessful in four. There was one death in the series, and that occurred in Case 11, where manual removal of the placenta had to be resorted to.

I consider that injection of the umbilical vein is a safe procedure; it is easy to carry out, is successful in the majority of cases, and if unsuccessful does no harm.

WILLIAM MORE, M.D., D.C.O.G.,
Assistant Medical Superintendent, Stepping Hill Hospital.
Stockport.

REFERENCE
Currie, D. (1937). *British Medical Journal*, **2**, 57.

Reviews

ST. THOMAS'S REPORTS

St. Thomas's Hospital Reports. Second Series, Volume III. (Pp. 240; illustrated. No price given.) London: St. Thomas's Hospital. 1938.

The first paper in the third volume of the new series is a fully documented and well-illustrated record of a very early case of *x*-ray dermatitis which, occurring severely within a year of the first exposures, showed carcinomatous changes fourteen years after the first contact and metastases in the lymph glands for the first time after twenty-nine years. In a series of obstetric papers it is suggested that many pregnant women suffer from a mild normocytic anaemia, but there is not sufficient evidence that it is due to pregnancy; age and poverty are other important factors. Administration of iron not only prevents a fall of haemoglobin further but improves the haemoglobin by nearly 10 per cent. on the average. Mr. F. H. Finlaison recommends proper ante-natal care of cases of breech presentation and version not later than the thirty-fourth to thirty-sixth week of pregnancy; spontaneous cephalic version is rare after the thirty-sixth week. The foetal mortality in breech labour (22.6 per cent. in the hospital) is much reduced after version. Mr. James Wyatt stresses the importance of haemolytic streptococci in puerperal infection and summarizes the treatment, especially emphasizing the rules for prophylaxis. The initiation and hopes of a children's psychological clinic at the hospital are described. No evidence was found of a lack of vitamin in the diets of children with rheumatism. Dr. D. P. King concludes as the result of his work that the biological test for Hodgkin's disease is probably given only by glands rich in eosinophil cells and cannot be relied on for accurate diagnosis.

Among the surgical papers Mr. George Perkins reviews the factors concerned in non-union of fractures, and concludes that this is nearly always due to local causes under the control of the doctor and should rarely occur if the principles of treatment are properly carried out. It follows that treatment of non-union consists in freshening the ends of the bone and applying the ordinary principles governing the treatment of a recent fracture. In reviewing the hospital cases of fracture of the patella over twelve years the surgical registrars found that differences of treatment and result occurred in stellate and transverse fractures. The former were treated satisfactorily by conservative methods so long as there was not separation of the fragments. The transverse fractures were preferably treated by operation with very satisfactory results; cases were noted in which full functional recovery took place, even with failure of bony union. Of a series of fifty-four cases of ureteric calculus commented on by Mr. R. H. O. B. Robinson ten patients passed the stone under purely medical treatment, twenty-three after cystoscopic manipulation, and in twenty-one operative removal was necessary. Among private patients as many as 90 per cent. may respond to medical measures. The diagnostic features are illustrated in a series of radiographs.

Mr. Harold Ridley points out that the prognosis of cure of detachment of the retina has risen in the last ten years from 4 to about 70 per cent. Myopes are much more often affected, not necessarily those of high degree. It is necessary to repair the hole. Gonin's original method of plunging an electrocautery through sclera and choroid in the region of the hole has been replaced by electrocoagulation by diathermy. Mr. P. G. Doyne shows that lacrimal obstruction is usually infective and appears to be more troublesome with advancing years. Methods of treatment are suggested.

Mr. N. R. Barrett in the light of fifty-one cases reviews the pathology, course, and treatment of putrid lung abscess. This is to be differentiated from bronchopneumonia, bronchiectasis, and such conditions as gangrenous carcinoma or suppurating hydatid of the lung. Usually the cause is aspiration of septic material at operation, but may be embolic. The infection is usually by anaerobic organisms. The degree of severity varies; some may undergo early spontaneous resolution; those that do not rapidly respond to nursing and postural drainage should be operated on, preferably by surgical exposure of the cavity and wide-open packing. Dr. Ingram Card reviews the history of growing knowledge of gastritis, its aetiology, symptoms, pathology, and treatment. Since the aetiological factors are multiple and varied no clear line of treatment is available, though modern work notes the significant association of gastritis with ulcer, cancer, and anaemia. The medical registrars have brought under review the hospital experience of cases of ulcerative colitis during the last ten years; colostomy or complete caecostomy to rest the diseased portion of the bowel appears to enable the patient usually to lead his life with little limitation of normal activities, and is recommended in patients who fail to respond readily to medical treatment.

ENCYCLOPAEDIA OF MEDICAL PRACTICE

The British Encyclopaedia of Medical Practice, including Medicine, Surgery, Obstetrics, Gynaecology, and Other Special Subjects. Volume Ten. Under the general editorship of Sir Humphry Rolleston, Bt., G.C.V.O., K.C.B., M.D., D.Sc., D.Ch., LL.D. (Pp. 688; 80 figures, 11 plates. 35s. net.) London: Butterworth and Co. 1938.

The outstanding features of the tenth volume of the new encyclopaedia are the articles on pregnancy and the puerperium, and the series on the psychoses and psychoneuroses. Professor F. J. Browne takes a wide survey of pregnancy, discussing first the physiological changes in the mother locally and generally, the signs of pregnancy, and the significance of the special tests available for diagnosis, before going on to detail the abnormalities that may arise, in the amount of amniotic fluid, local displacements of the uterus and haemorrhages, and the toxaemias of pregnancy, as well as the interaction and complications arising from the heart, digestion, endocrine glands, and general diseases and infections. The practitioner has here, as in Professor Leyland Robinson's excellent review of the problems of the puerperium and its treatment, complete and up-to-date teaching in one of the most important branches of his general work. The management and feeding of premature infants are given under a separate heading by Dr. R. C. Jewesbury.

In the middle of the series of articles on the psychoses and psychoneuroses is a practical and sensible discussion by Professor D. K. Henderson of the psychopathic personality, just as this individual stands in the middle of the psychopaths themselves. In former times it was sufficient for a man to do as he would so long as his conduct was not so anti-social as to make him a danger to his fellows. With the crowding together of the people and the need for the self-expression of the individual to be co-ordinated in the common good, the conception of psychopathic states has grown considerably. They are recognized as important because they are so numerous, because

they may be disruptive of organized society, and at present there is no adequate provision for them. These problems not only exercise the magistracy: the teaching profession, the heads of families, and the family physician must all give thought and effort in dealing with this extensive group, which, though diverse, has a common background of psychic immaturity, instability, impulsiveness, and egocentricity. The individual facets of this interesting, many-sided problem are illuminated by the series of authors chosen by the editors to deal with it. The practitioner will find not only the fullest general discussion but practical details for dealing with individual cases. Organic diseases of the nervous system, though bulking less largely, are again adequately covered by the associate editor and his colleagues.

The important sections in this volume on prostate diseases and pyelitis, and a short note on rejuvenation, are in the hands of Mr. Kenneth Walker; while Mr. W. B. Gabriel writes on diseases of the rectum. Dr. Reginald Miller gives a sound description of the clinical picture, source, and treatment of the acute rheumatic infection, and Dr. R. W. B. Ellis deals similarly with rickets. Retinal diseases and defects are covered in a useful article by Mr. R. C. Davenport, and the principal appearances are illustrated. Professor O'Donovan gives a list of diseases to be considered in a case of pyrexia of obscure origin, and there is a good summary of the application of radiology in diagnosis and treatment by Dr. Calthrop and Dr. Levitt. Noteworthy articles on special subjects are by Dr. W. G. Barnard on the duties and technique of post-mortem examinations, especially in medico-legal cases, and the medical aspects of poison legislation by Mr. Hugh N. Linstead. This volume continues the high standard reached by the former ones in giving general practitioners and specialists the up-to-date knowledge needed in their daily work.

STUDENT DAYS IN DUBLIN

Tumbling in the Hay. By Oliver St. John Gogarty. (Pp. 325. 10s. net.) London: Constable and Co. 1939.

Whether as author, as poet, or as wit, Dr. Gogarty needs no introduction. His new book *Tumbling in the Hay* is the younger brother of the well-known *Sackville Street*—amusing, inconsequent, and full of life. His scene is the Dublin of his student days, and in no city is the medical student allowed greater licence. The full flavour of the time and type is here. From hospital wards and examination rooms to the drinking of stout and singing of bawdy songs in pubs and brothels; and again to claret and great talking in the rooms of Trinity dons; it is all here, well spiced with anecdote and wit. And the characters! The English, it has been said, worship character, the Irish adore "characters." Dr. Gogarty has no lack of them—the grand Mahaffy, greatest talker in Europe; Yelverton-Tyrrel, whom even Mahaffy feared; a professor of moral philosophy who summed up life and his own profession in one devastating descent from Olympus; Purefoy the gynaecologist, who always operated in a top hat; Tom Myles, who quoted Shakespeare as he taught surgery; chronic medical students, including the ingenious gentleman who inuncted himself with blue ointment as a measure of prophylaxis; athletes, patriots, and harlots; Gogarty has laughed with and at them all.

To-day, even in Dublin, student days are not what they were. Medicine is becoming scientific in its old age, and there is too much to be learnt. But in the early years of the century, in a day when the senior surgeons frowned on the word "specialist," courses were less exacting: a man might find time to live as well as to learn, and here is one who lived high. Even at that time, though, men talked of the "good old days," and Dr. Gogarty has a story of a "character" of a preceding generation, a man of gigantic size (later to become a most eminent practitioner), who "on occasions of joviality could take an unsympathetic policeman in each hand and use them for cymbals as he led the chorus back to Steevens' Hospital. There were giants in those days."

The book is not an autobiography, it is not even a reminiscence: it is a mixture of atmosphere and anecdote. Its author writes nearly as well as he talks; one could offer his book no higher praise.

THROMBOSIS

Die Therapie der Thrombose. By Dr. Ernst Friedländer. (Pp. 117: 27 figures. RM. 5.40: bound RM. 6.) Leipzig and Vienna: Franz Deuticke. 1938.

This is a monograph consisting of some hundred-odd pages and a number of pen drawings. It represents Dr. Friedländer's experience in Vienna in the treatment of thrombosis and thrombophlebitis, and he tells us that between the years 1920 and 1930 there was an increase in the incidence of post-operative thrombosis among the cases in the Viennese clinics. It is of interest to notice that he favours the use of compression bandages and ambulatory methods for certain cases rather than the usual long periods of recumbency which in some clinics are followed almost as a routine. Another novel form of treatment is the relief of pain in certain cases of varicose ulcer by the intra-arterial injection (for example, into the femoral artery at Poupart's ligament) of substances such as "perparin." This little volume is a comprehensive one, and although clinical and therapeutic questions are given most prominence, it includes sections on examination, diagnosis, prophylaxis, and the furnishing and equipment of a special clinic for dealing with cases of varicose veins and their complications. The pathological and more academic aspects of the conditions under consideration are not neglected, but the tenor of the work is essentially practical. Treatment is given in some detail, and includes attention to methods of bandaging the walking case and to nursing in relation to the recumbent patient. The diagrams are clear and attractive and interspersed in an equally well-printed text, the translation of some of which is, however, difficult for the English reader. This is a practical little volume which might well be translated for the wider use of readers in this country.

IODINE AND THE THYROID

Iodine Metabolism and Thyroid Function. By A. W. Elmer, M.D. (Pp. 606: 33 figures, 86 tables. 30s. net.) London: Humphrey Milford, Oxford University Press. 1938.

This work by Dr. Elmer of Lwow, Poland, provides an exhaustive review of a subject which has developed rapidly in the past decade. This advance has depended upon the development of very delicate techniques for the estimation of iodine in body tissues and fluids, and modern methods of microanalysis permit the quantitative estimation of a fraction of a microgramme of iodine. Methods of this delicacy demand scrupulously accurate technique and numerous special precautions. The author has worked for many years on the subject and provides a valuable critical review of the methods of iodine estimation.

The outstanding feature of normal iodine metabolism is the minuteness of the quantities of iodine involved. About 0.5 mg. iodine is present in the blood of a man, and less than half of this amount is required daily to maintain equilibrium. The main facts regarding iodine

deficiency and endemic goitre are now well established, but the exceptions to the general rules are sufficiently numerous to create serious difficulties. There is, for example, little agreement regarding the minimum daily iodine requirement sufficient to prevent goitre. Fortunately there is general agreement regarding the efficacy of iodide medication in the prevention of endemic goitre. Another problem of outstanding therapeutic importance which is discussed fully by Dr. Elmer is the pathogenesis of thyrotoxicosis. The importance of the anterior pituitary gland in this connexion is described, and an account is given of the interesting experiments in which the author demonstrated the action of inorganic iodides in antagonizing the effects of overdosage with the thyrotropic hormone.

This large volume (606 pages) gives a full review of the subjects described in the title, and a rather special feature is the critical estimate given concerning the reliability of the various measurements of iodine metabolism.

OBSTETRICAL PRACTICE IN THE EAST

Clinical Obstetrics. By A. Lakshmanaswami Mudaliar, B.A., M.D., F.C.O.G. (Pp. 819; 204 illustrations, 9 of which are coloured. 27s. net.) Edinburgh: Oliver and Boyd. 1938.

This book has quite evidently been written by a clinician trained in Edinburgh. Professor Mudaliar lectures in the University of Madras on obstetrics, and teaches both established facts and the latest views, but always with an emphasis of his own based on practical experience in a well-equipped maternity hospital. The section on eclampsia shows this method at its best. Thus his textbook is no mere repetition of his predecessors' productions. It has been put together with great care, and the whole subject is well covered. Any student or obstetrician will find all he needs both as to theory and practice, including even mental hygiene.

The clinical emphasis perhaps accounts for the extreme compression of the two pages on fertilization and ovulation. The student is referred to textbooks on embryology, but a note on the X chromosome and determination of sex would have been interesting. Ante-natal treatment is detailed, except for the method of measuring the height of the uterus. Though aseptic technique is insisted upon throughout, the author is sceptical about droplet infection; if he wears a mask he does not say so. His confidence in contraceptives is *nil*. Feeds are given much more diluted than is the fashion in England, but three-hourly for the first three months. One wonders why no precautions are prescribed against the common nutritional anaemia.

The teaching about malaria and the other tropical diseases with reference to pregnancy and parturition is most valuable. Professor Mudaliar uses quinine freely, pointing out that it is the malarial pyrexia, not the quinine, which causes abortion. He combines it with sedatives, but mentions only bromides, whereas opium or morphine is perhaps of more use. In the discussion on ventrofixation the type of suspensory operation which uses the round ligaments seems to have been forgotten. Analgesia and anaesthesia in labour are relegated to an appendix and not very fully treated.

The book is up to date, including reference to sulphonamides; their revolutionary effect, however, on the treatment of puerperal sepsis, still less of *B. coli* pyelitis and of typhoid, has not been fully felt. Some of the discarded hypotheses—for example, as to the causation of labour—might have been omitted, and more recognition given to the interaction of the hypophysis and ovarian hormones. Oestroform for the induction of abortion is not used, only pituitrin. The illustrations are well defined, correct, and sufficient in number. The print is clear, the binding strong, and the index excellent. A good, carefully written, and complete textbook for the practitioner working in the East.

Notes on Books

The work on *Postvaccinial Encephalitis* (Vienna: Julius Springer, RM. 4.80), by Drs. MARIUS KAISER and JULIUS ZAPPERT, contains an account of their experience of 240 genuine cases which occurred in Austria between 1925 and 1935 inclusive. There were no cases in the first year of life and only a few during the next three years, the great majority being found between the ages of 6 and 11. As regards season, the bulk of the cases (207) were met with in May, June, and July. The number of insertions and the method of vaccination had no influence on the incidence of the encephalitis. Only one case followed revaccination. Seventy-three deaths occurred—a fatality rate of 30.4 per cent., which was similar to that in Holland (30.8 per cent.) and Germany (34.8 per cent.), and much lower than that in England (58 per cent.). The incubation period ranged from two to twenty days, but the great majority of the cases occurred between the seventh and fourteenth days after vaccination. In 110 patients who survived, and about whom reliable information could be obtained, recovery was absolutely complete. Necropsies were performed in forty-five cases, and showed that the lesions were chiefly found in the white substance of the cerebrum, although the grey matter of the cortex did not escape. The pons and medulla were in some cases much affected, and slight lesions were present in the cerebellum. Pneumonia or purulent bronchitis was not infrequent. With one exception, in which the histological findings were indefinite, the histological picture was characteristic of postvaccinial encephalitis. As regards treatment, the number of cases in which the blood of recently vaccinated persons or animals has been employed is at present too small to be conclusive.

Die Arzneikombinationen, by Professor EMIL BÜRGI (Berlin: Julius Springer, RM. 12), gives a short account of a very scattered and difficult subject—the combination of drugs. The quantitative estimation of the action of a single drug is difficult, and only rarely is there a simple linear relation between dosage and amplitude of effect; hence it is extremely difficult to determine whether the action of drugs A and B given together is greater or less than the sum of their separate actions. The author gives a review of a large amount of the work that has been done on the subject, but the quality of the work varies widely.

The Pharmacology and Therapeutics of the Materia Medica, by Professor W. J. DILLING, is the fifteenth edition of the textbook that was previously edited by Bruce and Dilling. The general arrangement adopted in previous editions has been retained, but the volume has been reset in a more convenient size. The numerous therapeutic advances made since the last edition appeared in 1933 have called for extensive revisions and additions. Some of the new substances which now appear are retarded insulins, sulphonamides, nicotinic acid, viper venoms, cortin, and evipan sodium. The book is published by Cassell and Co. at 10s. 6d.

A third edition (1939) of *Physical Exercises for Asthma* has been issued by the Asthma Research Council. Copies can be obtained for 1s., post free, from the Asthma Research Council, c/o King's College, Strand, London, W.C.2. The secretary informs us that 10,000 copies of the second edition have been disposed of in fourteen months.

DR. ROBERT HUTCHISON'S PORTRAIT

PRESENTATION CEREMONY

Lord Macmillan presided at a pleasing ceremony at the House of the Royal Society of Medicine on March 1, when Dr. Robert Hutchison, P.R.C.P., was presented with his portrait which has been painted by Mr. James Gunn. The room in which the presentation was made was crowded out with notabilities in the world of medicine.

Sir Lancelot Barrington-Ward gave a brief account of the circumstances in which the gift was made. He said that the members of the Edinburgh University Club in London felt that Dr. Hutchison's work in medicine deserved recognition on the part of his many friends, and that the most pleasant form such recognition could take would be to give him his own portrait. A small subcommittee was formed, which, of course, rapidly enlarged, and a letter was sent out signed by many distinguished people far beyond the confines of the club. Mr. James Gunn was chosen to undertake the commission, and those concerned were very happy to have Lord Macmillan, a very old friend of Dr. Hutchison, to preside on the occasion.

Lord Macmillan's Tribute

Lord Macmillan recalled some words of Kipling which were appropriate: "Recognition by one's equals and betters in one's own craft is a reward of which a man may be unashamedly proud." The only emendation he would make was that he doubted whether Dr. Hutchison had any betters in his own craft. The great medical profession did not figure in the public eye as some other professions did, and there were few occasions on which lay people had the opportunity of expressing gratitude and admiration for its leaders. There was a striking sentence in the Introduction to the Roll of the Royal College of Physicians, to the effect that the more successful a physician and the more he was engaged in the duties of his office, the less was there to merit observation or to court publicity. The physician's art, as Dr. Johnson said, lay in domestic privacy, and silent duties and silent excellencies were soon forgotten. The more reason, surely, that when an opportunity such as this presented itself they should seize it in order to do honour to a great man.

Lord Macmillan went on to say that Dr. Hutchison and he graduated from Edinburgh University in the same year—1893—and he himself would never forget the years he spent in the University. Beyond compare the medical faculty in Edinburgh at that time was at its zenith. He recalled the names of Rutherford, Fraser, Simpson, and many others. So great was the attraction of that famous medical school that, quite frankly, it very nearly swept him (Lord Macmillan) off his feet, in which case "the law would have been robbed of one of its most distinguished judges." Whether he would ever have attained to such a position as Dr. Hutchison occupied, which was only comparable with that of the Lord Chancellor in his profession, he did not know, but he remembered how many of his own friends entered medicine, the enthusiasm for its study at that time, and the vitality in the medical school which infected all the other faculties.

In course of time Dr. Hutchison came south, and, unlike the unhappy refugees of the present day, he found the refugee's lot an exceedingly fortunate one. His career had been an arduous one of beneficence, but he had been more than a medical practitioner; he had been a man of affairs and a man of letters, and had adorned every sphere he occupied. He held at least five doctorates of various universities. He was only the third Scottish graduate to hold the high office of President of the Royal College of Physicians of London, and only the second from the University of Edinburgh.

"Our two professions have this in common, that we both at least profess to be learned professions, and an old writer has said of us both that medicine and law are essentially intellectual and learned in character, and require for their cultivation the traditions, resources, facilities, and contacts which exist within a university and nowhere else. That explains why it is that the present occasion has found its inception in the university associations of Dr. Hutchison. Our professional vocations led us along different paths, but we occasionally come into contact with each other. For six years of my life I was an examiner in forensic medicine, and I used to examine with a professor of medical jurisprudence beside me. In the oral examinations he was in terror lest he made a mistake in law, and I was in equal terror lest I made a mistake in medicine, and so between us the students got off pretty easily! In connexion with Dr. Hutchison's subsequent career I did have one charming association with him. For some years it was my privilege to be chairman of the board of management of the Hospital for Sick Children at Great Ormond Street, and Dr. Hutchison sat at the same board. To that and to the London Hospital he gave some of the best of his work; it was always delightful to listen to his shrewd words of counsel, and when any proposal was a little open to criticism a few deadly words, pronounced in that austere but kindly fashion of which he is such a master, somehow or other always led us into the safer and more expeditious course. . . .

"There is one thing that no artist can express, no writer commemorate, which will always be a purely personal matter in our own hearts, and that is the sense of personal friendship. This is what matters most, and while we recall the brilliance of Dr. Hutchison's career, how he graduated with a bevy of scholarships and distinctions, including the Ettles Scholarship, which is the high-water mark of academic distinction in the University, there will always remain for us something which no university honours can sufficiently signalize, no portrait, however admirable, portray—namely, the personality of a great man and a good and loyal friend."

Dr. Hutchison's Acknowledgment

Dr. Robert Hutchison said that there were occasions when it was no mere figure of speech to say that it was supremely difficult to express one's feelings. He confessed to some apprehensions when he heard that it was proposed to have his portrait painted, but his first apprehension disappeared when he knew that Mr. Gunn was to be the painter, and he was quite content to let himself go down to posterity as Mr. Gunn had depicted him. He had given Mr. Gunn fourteen or fifteen sittings of two hours each; it was not nearly such an ordeal as he had supposed; artist and sitter had learned to understand each other thoroughly and had become lasting friends. He thanked all those who had contributed to this presentation, especially those who had crystallized all the latent good feeling which had proved to be more widespread than he could ever have supposed.

A telegram was read from the Royal Infirmary (Edinburgh) Old Residents' Club sending "greetings to a great clinician, brilliant teacher, and fascinating writer, and wishing him long life, health, and happiness." The company afterwards surrounded and admired the fine painting which Mr. Gunn has executed. It depicts Dr. Hutchison in the gold-embroidered black robe of the President of the Royal College of Physicians.

The American Association for the Study of Goiter again offers the Van Meter Prize Award of 300 dollars and two honourable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The award will be made at the annual meeting of the association, which will be held in Cincinnati, Ohio, on May 22, 23, and 24, providing essays of sufficient merit are presented. The competing essays may cover either clinical or research investigations; should not exceed three thousand words in length; must be presented in English; and a typewritten double-spaced copy sent to the Corresponding Secretary, Dr. W. Blair Mosser, 133, Biddle Street, Kane, Pennsylvania, not later than April 15, 1939.

WORLD HYGIENE

SURVEY BY THE HEALTH OFFICE

The Permanent Committee of the International Health Office, Paris, held its ordinary session for 1938 last October, when questions on the application and interpretation of the various international sanitary Conventions were discussed at the plenary sessions of the committee and at the meetings of the various commissions. The following is an outline of some of the principal features of the report.

Air Navigation

The committee examined a suggestion sent to it by the Director of the Eastern Bureau of the League of Nations at Singapore, an organization which in virtue of Article 7 of the 1926 Convention acts as a regional bureau for the International Health Office. This suggestion was that the system of international quarantine messages in use in maritime navigation should be extended and adapted to the requirements of the control instituted by the International Sanitary Convention for Aerial Navigation, 1933; but the principle of extending to air navigation a system which is hardly related to the actual conditions of air travel gave rise to difficulties.

As the result of a study, begun at the previous session, of the conditions in which aircraft could be freed from mosquitos during flight, the committee learned with much interest of the tests made in British India and by Imperial Airways of "deskito," an insecticide which is efficacious, can be rapidly diffused, is not inflammable, having a watery basis, and does not seem to affect the passengers.

Narcotic Drugs

The studies carried out in fulfilment of the Geneva Narcotic Drugs Conventions of 1925 and 1931, in relation to desomorphine and preparations containing extract or tincture of Indian hemp, have been brought to a conclusion. As regards desomorphine, the committee considers that this preparation should be placed under the control provided for in the above-mentioned Conventions and that preparations with a basis of extract or tincture of Indian hemp should equally be placed under control, with the exception of the skin applications, until a method has been discovered of determining exactly the content of cannabinol in a preparation.

Plague and Yellow Fever

A report of the Sanitary Administration of the Belgian Congo states that the focus of sylvatic plague on Lake Albert was still persisting in 1937, when there were six cases and six deaths, three of which were bubonic, two pneumonic, and one septicaemic. Investigations undertaken during the year showed that *Mastomys ugaudoe* (*M. coucha*), together with other murine species, can transmit the virus, but that *E. rattus rattus* plays no part in the endemic disease, because it is not found there.

British Guiana appears for the first time for many years in the list of yellow fever countries. Two Indians in the Rupununi district of this country were affected, and out of forty-six samples of blood collected from natives in the region five gave a positive result with the mouse-protection test. This is comparable with the positive results recently obtained in the neighbouring colony of Dutch Guiana. In Brazil the incidence of yellow fever covers a very large area, comprising particularly the States of Minas Geraes, Rio de Janeiro, and Sao Paulo; the number of deaths confirmed by histological examination after viscerotomy reached 250, which gives grounds for presuming that the general mortality was considerably higher. All the cases notified belong to the "jungle yellow fever" type, which occurs in the absence of *Aëdes aegypti*. Inoculation against yellow fever has been carried out on a large scale in Brazil since September, 1937, when the use of the pantropic virus, known as Virus 17D, was introduced. The number of persons vaccinated at the end of September, 1938, is reported to be as many as a million. In London, where the same vaccine is now used, 3,500 persons have been immunized, and among them no jaundice has occurred.

Tuberculosis

The frequency of the tubercle bacilli of bovine origin in pulmonary tuberculosis has been investigated in Italy by cultivation of homogenized sputum on the three culture media of Petragnani (5 per cent. glycerin, 3 per cent. glycerin, and the wax medium). Only the latter is favourable to the bovine bacillus; 564 cases have been so examined and the bovine bacillus has been detected only four times.

In the United States BCG has been used in the City of New York. The latest reports do not show that this vaccine has caused any harm; on the contrary, the death rates calculated on approximately 766 children have been lower among those vaccinated than among the controls (twice less among those vaccinated by ingestion and four times less among those parenterally vaccinated). Hence it has been thought advisable to continue the experiments.

Psittacosis

In the United States the prophylaxis of psittacosis appears to be fairly efficacious; in 1937 only three cases were recorded in the State of New York and one in California.

In the Faroe Islands (Danish) some cases have been observed during the last few years of a disease apparently identical with psittacosis, said to be propagated by a sea bird, the fulmar petrel (*Fulmaris glacialis*); the matter is under investigation.

Poliomyelitis

In 1938 an epidemic of poliomyelitis began in Great Britain in July; it lessened at the end of September. For England and Wales 290 cases were notified in August and 340 in September. The proportion of adult cases appears to have increased as the epidemic continued.

In Holland an epidemic of poliomyelitis began in the middle of July, 1938. By the middle of October from 350 to 400 cases were recorded, a large figure for the country. Cases were much more numerous in the country districts and small towns than in the large towns.

In Sweden poliomyelitis is decreasing; 3,000 cases were recorded in 1936 and 1,931 cases in 1937; in 1938 951 cases were recorded to the end of September, from which a total of about 1,500 may be anticipated for the year. Contrary to what has been observed elsewhere, it has fairly often been noticed that several cases have occurred in the same family. The proportion of adults affected is increasing. The proportion of cases without paralysis was roughly 26.8 per cent. in 1938. Certain fresh facts lend support to the theory that the portal of entry of the virus may be found in the alimentary canal. In fact, mesenteric glands containing the virus of the disease in a virulent state have several times been found at necropsy; it was also possible to infect a monkey with poliomyelitis by means of the liquor used for the lavage of the intestine of a sick person.

In the United States 9,511 cases of poliomyelitis were recorded for 1937, representing an incidence of 7.3 per 100,000 in the regions where it is notifiable. It is noted that, as in other countries, the disease has no longer the same degree of predilection for early childhood. Chemoprophylaxis by antiseptic injections into the nasal cavities has been practised in certain epidemics, without, however, any demonstrable results.

Treatment by serotherapy is systematically practised in most countries, although its efficacy is doubted by various authorities.

Drug Addiction in the U.S.A.

In the United States intoxication from opium smoking has not entirely disappeared; it has never been possible fully to apply the provisions for the gradual suppression of the practice of opium smoking of the Convention of 1912. On the other hand, the application of the Convention of 1931 has fortunately reduced the possibilities of intoxication by opiates: at the hospital at Lexington only 20 per cent. of

the narcotic addicts admitted were sufficiently seriously affected to serve as subjects for study. At this hospital the cure of addicts to morphine and other opiates is practised by rapid withdrawal in four to ten days, and during the "weaning" period recourse is had to various auxiliary remedies—for example, baths, anti-diarrhoeic drugs, paraldehyde for cases of insomnia, dextrose injections for poor appetite, psychotherapy, etc. Several active medicinal forms of treatment (scopolamine, rossium, insulin) have had to be abandoned owing to unsatisfactory results; certain of them are based on theoretical considerations which have not been confirmed.

In the U.S.A. intoxication from Indian hemp does not arise from medical preparations, the use of this drug having been practically abandoned; it results from the custom of smoking Indian hemp, a practice imported from Mexico ten or fifteen years ago with "marihuana" cigarettes. This practice was the subject of a prohibition law (the Marihuana Tax Act, 1937); but Indian hemp grows in certain regions of the United States, where it is clandestinely cultivated.

Cancer of the Lungs

An inquiry based on the death returns was conducted in the U.S.A. from 1930 to 1935 into the absolute and relative frequency of cancer of the lungs. Although deductions must be cautiously drawn, it has been established that death from cancer of the lungs, almost *nil* under 35 years of age, attains its maximum between the ages of 65 and 74 years; that men are affected more than women, and the white population more than the black. The death rates from cancer of the lungs and pleura, which varied from 0.94 to 4.36 per 100,000 inhabitants according to regions, sex, and race, have increased from 1930 to 1935. This increase is far in advance of that of all other forms of cancer and of all regions of the body which has been recorded during the same period. The proportion of deaths from cancer of the lungs in relation to other varieties of cancer rose from 2.4 per cent. to 3.2 per cent.: 2 to 6 per cent. of the admissions to hospitals for cancer is due to cancer of the chest and pleura.

Demography

In spite of the efforts of France to increase the birth rate it is still very low, the number of births having fallen from 630,000 in 1935 to less than 620,000 in 1937. From a comparative study of the birth rates in the towns and in the country it appears that if France is becoming depopulated it is essentially at the expense of the rural population; in only seven Departments out of sixty-one studied was the average birth rate of the Department higher than that of the principal town.

The Open Door Council at its meeting in the Caxton Hall, Westminster, on Saturday, March 18, will discuss, among other matters concerning the position of women, a long resolution passed at an international conference held at Girton College, Cambridge, last year on the subject of nutrition policies as they affect the woman worker. This resolution calls the attention of all who have studied the problem of national nutrition to the grave danger to the health of women and the nation of accepting uncritically the current belief that women require less food than men. The Open Door International demands that in all recommendations as to nutritional needs and in all tables of diet drawn up in connexion with such recommendations the minimum food allowance for an adult woman shall not be less than the minimum food allowance for an adult man, and that the minimum allowance for boys and girls at various ages shall at each age grouping be the same. Other subjects to be discussed at the morning and afternoon sessions are women's paid work in emergency services, women in health and unemployment insurance, and population problems in relation to women's right to work. Admission is free without ticket. Copies of the agenda paper and other information may be obtained from the secretary of the Open Door Council, 97c, Kensington Church Street, London, W.8.

Nova et Vetera

SURGEONS ALL

Nature seems to have endowed Harvey Graham with several of the qualities which go to make a good historical writer. He is accurate, has a sense of humour, imagination, and a facile pen. He has used these faculties most successfully in *Surgeons All*, and has written a very interesting book, well illustrated and on a somewhat novel plan.[1] He takes the various civilizations—Indian, Egyptian, Greek, Roman, Arabic, and contemporary—describes the main features of the surgery, and illustrates them by details about some of those who practised at the time. He has read widely and has gone to reliable, but not original, sources for his information. He has, too, avoided the use of technical terms, and the book, therefore, can be read with pleasure by those who are not doctors.

The opening chapter gives a realistic account of an operation as it might have been done in the Stone Age. The Italian, French, Dutch, German, and English schools of surgery are described. There is a particularly brilliant account of Edinburgh surgery telling of the relationship which existed between Syme and Liston, and how Lister came into the picture a generation later. For the groundlings and those who prefer horrors and fraud to surgery the author provides chapters on grave-robbing, quacks, and Mary Toft, who produced rabbits instead of children at Godalming, and set all London in a ferment in 1726. The final chapters deal with the surgeons of to-day and to-morrow, and ends on a hopeful note with a forecast of the future.

Dr. Oliver St. John Gogarty—author and poet—introduces the volume with a characteristic foreword. The unusual accuracy of the information makes it appear that Harvey Graham is merely the pen name of one who is or has been a practising surgeon. The book must of necessity reach a second edition. When it does so the illustrations should be brought nearer the letterpress to which they refer; Sir Humphry Davy's name spelt without a redundant "e"; Tindall should become Tyndall; and torcular Herophilii, in the index, should be robbed of its superfluous "i." There is a list of works consulted and an excellent double index, the one of names, the other of subjects. On the whole, a book to be highly commended both for information and style.

D'ARCY POWER.

Dr. Xavier Georges Marie Rousseau has devoted his inaugural thesis (*Thèse de Paris*, 1938, No. 381) to a medical study of the well-known French writer, Henri Beyle, commonly known as Stendhal, author of *Le Rouge et le Noir*, *La Chartreuse de Parme*, and other works. According to Dr. Rousseau, Stendhal was the subject of an arthritic diathesis manifested by obesity, tendency to congestion, gout, chronic rheumatism, and gravel associated with chronic indigestion. Disturbance of his nervous system in spite of his high intellectual gifts assumed various forms, such as alternation of stages of exultation and depression, early sexual precocity, instability, and irritability. He certainly contracted gonorrhoea, but there is some doubt whether he had syphilis. A year before his death he developed the first symptoms of the apoplectic stroke which carried him off at the age of 59.

A committee has been formed at Limoges to raise a monument to Jean Cruveilhier, the physician and anatomist, who first distinguished gastric ulcer from cancer of the stomach in 1830. Cruveilhier was born at Limoges in 1791, president of the Académie de Médecine in 1859, and died in 1874.

[1] *Surgeons All*. By Harvey Graham. With a foreword by Oliver St. John Gogarty. (Pp. 426; 24 plates, including a frontispiece. 18s. net.) London: Rich and Cowan. 1939.

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TRACE ELEMENTS IN ANAEMIA

Traces of many elements have at one time or another been credited with a role in haemoglobin building, and in man arsenic, copper, germanium, and manganese have been prescribed as adjuvants to iron medication. Much confusion has arisen from generalizing from animal experiments without regard to difference in zoological species or dietetic conditions. In the rat, which has been most closely studied, copper is an essential supplement to iron for the formation of haemoglobin and is unique in this connexion. In the iron-deficiency anaemias of the dog and the pig no addition to iron appears to be necessary. There are fatal diseases of sheep and cattle in Australia and New Zealand, variously known as coast disease, enzootic marasmus, and bush sickness, which are characterized by emaciation and oedema. For a time they were attributed to iron deficiency because they could be successfully treated by limonite ($Fe_2O_3H_2O$), but it was later shown that the action of the limonite was due to traces of cobalt and that the anaemia could be cured by cobalt alone. Cobalt produces in the rat a true polycythaemia, involving an increase in the blood volume. The results in other laboratory animals are somewhat equivocal, nor is much known about possible therapeutic actions in man, though it has been shown by Underwood[1] that the commonly used preparations of iron contain significant quantities of cobalt.

Two methods have usually been employed in the study of the possible value of copper in anaemia in man. Series of cases treated with iron plus copper have been compared with cases treated with iron alone, or patients have been treated with iron first and copper has been added later as a supplement. Few of these experiments have been entirely satisfactory, inasmuch as the amount of copper in the diet and the iron preparations has rarely been controlled. Copper is a frequent impurity in iron salts, and the poorest diets in this country contain about 4 mg. a day, which is more than enough for haematopoiesis. It is unlikely that the repair of anaemia in adults in this country is ever delayed by shortage of copper. Conditions may be different in Japan, where Sai[2] has studied the effect of blood transfusion with or without the simultaneous injection of copper in women who had lost blood in childbirth. The addition of copper much increased the effect of transfusion. The experiments were then repeated on women with chronic anaemia, and again it was found that the addition of copper to the blood transfusion greatly accelerated the regeneration of red cells and haemoglobin.

In infants on an exclusive milk diet there is more reason for supplementing iron with copper, and J. H. Hutchison[3] has produced evidence that the position as regards copper in the human infant is identical with that in the rat. Although in rats anaemia cannot be cured by pure preparations of iron, the salts are nevertheless assimilated and stored in the liver and spleen. If copper is subsequently given the iron in the liver is removed and converted into haemoglobin. Copper therefore seems to take some part in the synthesis of haemoglobin, perhaps by the preliminary formation of a copper porphyrin and the subsequent replacement of copper by iron. Hutchison treated infants first for one to three weeks with pure ferrous sulphate, and then, after a pause for the haemoglobin to become constant, administered copper by mouth as cupric sulphate. The iron metabolism of each patient was demonstrated by a balance study. In this way the amount of iron retained in the body was estimated and the percentage of retained iron utilized in the formation of new haemoglobin was calculated. The study confirms previous work, already reviewed in these columns,[4] in showing that the body is capable of retaining large amounts of iron administered in an inorganic state, and that in anaemia only a small percentage of the total retention is available for haemoglobin synthesis. On discontinuance of the administration of iron, although there is enough iron in the body to provide for several times the haemoglobin requirement, further utilization does not take place to any great extent. The inefficacy of small doses of iron does not depend upon imperfect absorption from the gut, and the need for massive dosage appears to be due to the activity of the storage mechanism, which must be flooded with iron if any is to overflow and be available for haemoglobin synthesis. Hutchison found that when haemoglobin regeneration declined or ceased after the cessation of iron therapy it could be renewed by the administration of copper alone. Moreover, when iron was administered in subliminal doses the subsequent administration of copper enabled the iron which had been absorbed to be assimilated into haemoglobin. It appears that copper, acting as a catalytic agent, enables iron to be converted into such a form that it can be transported by the blood plasma from the storage depots to the bone marrow and there utilized in the formation of haemoglobin.

[1] *Proc. Soc. exp. Biol.*, N.Y., 1937, **36**, 296.
[2] *Tohoku J. exp. Med.*, 1938, **33**, 369 and 379.
[3] *Quart. J. Med.*, 1938, **8**, 397.
[4] *British Medical Journal*, 1937, **2**, 970.

CANNING BEFORE CHICAGO

Readers of Upton Sinclair, who since their childhood have associated canning of meat with the bellowing stockyards, the reeking factories, and the squalid overcrowded tenements of Chicago, may be surprised to learn how old the canning industry is and under what reputable conditions it had its birth. According to a paper by Professor J. C. Drummond and his collaborators[1] the Frenchman Nicholas Appert laid the foundations of the modern process of canning during the latter years of the eighteenth century. Appert found that if food substances of various types were filled into properly sealed glass jars and exposed to the temperature of boiling water for a sufficient length of time they would remain unchanged indefinitely. Appert's preparations, which included a wide range of meats, vegetables, fruits, and even milk, were tried out experimentally by the French Navy about 1806, and apparently proved successful. In the following year a process was developed by John Hall of the Dartford Iron Works and Bryan Donkin, a Fellow of the Royal Society, in which iron containers were substituted for the glass jars used by Appert. Trouble was experienced for a time, but after a number of failures a satisfactory technique was developed, and a demand for Donkin and Hall's preserved foods was created in the Navy, where the "soup and bouilli" was regarded as a special delicacy for sick sailors. The convenience of this method of preserving food was soon realized by Arctic explorers, and in 1819 Parry took out a supply of preserved meats on his first voyage of discovery of the North-West Passage. In 1841 Stephen Goldner filed a patent for a process in which the air was driven off by heating the unsealed can in a bath of calcium chloride to a temperature of 270° to 280° F. Like subsequent observers up to the time of Pasteur and after, he believed that air or oxygen was responsible for putrefaction, and that only by removing it completely could fermentable organic substances remain undecomposed for long. Unfortunately Goldner in some of his contracts used large "packs" of 6 lb. or more, the interior of which was not effectively sterilized, so that considerable quantities of the food went bad and a Government Select Committee had to be appointed to inquire into the scandal. In the second half of the nineteenth century developments in the canning industry proceeded apace. A factory was opened in New South Wales in 1848, and the American meat factories at Chicago and elsewhere began to operate about 1868.

[1] J. C. Drummond, W. R. Lewis, T. Macara, G. S. Wilson, and H. L. Shipp. *Chemistry and Industry*, 1938, **57**, 808, 827, and 914.

Professor Drummond was fortunate in learning of the survival of two canisters of food prepared by the Donkin process, and still more fortunate in obtaining permission to examine them. The first was a 4-lb. tin of "roast veal," which formed part of the stores of H.M.S. *Hecla* on Captain Parry's third voyage to the Arctic in 1824 and which was brought home and taken out again to the Arctic on the fourth voyage in 1826. It had remained unopened for many years in the museum of the Royal United Services Institution. The second was a 2-lb. tin of "carrots and gravy," which was taken out on the third Arctic voyage and which ultimately became an exhibit in the National Maritime Museum at Greenwich. The original instructions for opening these canisters, which were made of wrought iron and looked more like bomb cases than tins, were "to cut round on the top near to the outer edge with a chisel and hammer." Since it was desired to measure the pressure of gas inside the cans, to draw off samples of gas for analysis, and to take specimens of food under aseptic conditions for bacteriological examination, these instructions were not very helpful. No suitable apparatus for opening them was available, and it was largely owing to the ingenuity and persistence of Mr. T. Macara of the British Food Manufacturers' Research Association that a new and effective type of instrument was devised for the purpose. After several months of preparation and consultation everything was ready, and on the morning of February 11, 1938, the tin of roasted veal was opened. The greatest precautions were taken in the sterilization of the apparatus and the outside of the canister. The piercing instrument behaved admirably, but the moment it perforated the top gas rushed out under such pressure that some of the mercury was blown from the manometer. Whatever the pressure was it was certainly over 15 lb. per square inch. Samples of a creamy soup-like fluid were withdrawn by sterile Pasteur pipettes, and then, after the hole had been enlarged by hammering in a red-hot poker, pieces of solid meat were extracted by sterile bullet forceps. Somewhat contrary to expectation there came out through the opening of the heated tin not "a very ancient and fish-like smell" but the highly appetizing odour of warm soup.

Chemical analysis showed that the gas consisted mainly of hydrogen, which had apparently been formed as the result of the action of the acid soup on the internal tin lining of the canister. The meat itself was in excellent condition, and, though the fat had been largely hydrolysed, no trace of rancidity was detectable. To the taste the meat was perfectly good, though a little insipid, and when fed to young rats over a period of ten days

it caused them to grow at the normal rate. Analysis failed to reveal the presence of vitamin B, but both flavin and vitamin D were found. Bacteriological examination, which was carried out at the London School of Hygiene and Tropical Medicine and at the Food Research Laboratories, resulted in the isolation of three different types of aerobic spore-bearing bacilli, all of which were capable of growing at 55° C. These organisms, which must have been alive for over a hundred years, were probably derived not from the meat itself but from the flour which was used to thicken the soup.

The tin of carrots and gravy was opened some days later, but was found to be bacteriologically sterile. Again there was a high pressure of gas inside the tin, and the gas itself consisted mainly of hydrogen. Insufficient material was available with which to carry out an animal test for the presence of ascorbic acid, but carotene was found in a concentration little inferior to that present in fresh carrots. There is no doubt that the highly anaerobic conditions existing in both canisters were responsible for the preservation of the more labile chemical constituents of the foods. After thorough examination of the metal containers by Mr. W. R. Lewis of the International Institute for Tin Research they were handed back to their owners, and the tin of roast veal is now once more an exhibit in the Royal United Services Institution in Whitehall.

CHEMISTRY AND BIOLOGICAL ACTIVITY OF INSULIN

Since Abel and his co-workers in 1926 first obtained insulin in crystalline form a large amount of chemical and physical work has been done on the pure protein. The hormone has a molecular weight of 35,000, a value which is very similar to those found for other crystalline globular proteins, like pepsin, egg albumen, and Bence-Jones protein. A very careful *x*-ray examination of the crystals by Crowfoot[1] showed that the unit cell is rhombohedral and contains a single hydrated molecule of the weight of 37,000. Scott[2] discovered that the crystalline insulin molecule contains six atoms of zinc as part of its molecular structure. He suggested that the zinc atoms might be found in a salt-like linkage to carboxyl groups of dicarboxylic amino-acids. Scott also showed that the pancreas contains appreciable amounts of zinc, and recent work in different countries has produced definite evidence that the zinc content of insulin has a marked influence on the biological response to this hormone. Chemically insulin behaves like a typical protein. It is remarkable for a high sulphur content, which can be accounted for by cystine which is present as such—that is, in a disulphide linkage (Miller and du Vigneaud[3]). In its amino-acid composition, especially in its high content of glutamic acid and tyrosine, insulin resembles the cereal prolamines, with which it shares a solubility in acid aqueous alcohol. Compared with other crystalline proteins insulin exhibits a very high degree of stability towards heat in acid solution. Many other hormones or biocatalysts of protein nature owe their biological activity to a specific grouping present in the molecule, such as thyroxine in thyroglobulin or haeme in haemoglobin. In many other cases the protein acts as a carrier for the active principle which itself is not a protein or amino-acid. Insulin, however, does not contain any constituent not found in other proteins—that is, it does not contain a "prosthetic" group—nor has it been possible to separate the activity from the molecule as a whole; hydrolysis, either by acid, alkali, or enzymes, destroys the activity completely. The possibility, however, cannot be excluded that the hypoglycaemic effect of the hormone is due to a specific peptide structure within the molecule, which breaks down very easily under the action of acids and enzymes. By treating the hormone with different chemical reagents it has been shown that the integrity of certain groups and linkages is indispensable for the biological activity. Thus a reduction of only few S–S groups to SH diminishes or abolishes biological activity; reoxidation of sulphydryl to disulphide linkages does not restore the activity, an observation which may be explained by the assumption that reoxidation will join sulphur atoms other than those originally combined in the unchanged molecule; or, in other words, any disturbance of the internal structure of the molecule destroys the biological activity. Other groups which are important for the biological activity are the phenolic OH– groups and the carboxyl groups. Thus Harington and Neuberger[4] inactivated insulin by introducing iodine in 3:5 position into the benzene nucleus of tyrosine; partial removal of the iodine by catalytic reduction was accompanied by a proportional restoration of activity. Similarly, blocking of the carboxyl groups by esterification (Carr, Culhane, and Underhill[5]) destroyed the activity, which could be at least partially restored by saponification. On the other hand, blocking of amino groups has no marked effect on the hypoglycaemic effect of insulin. The whole question of the relation between chemical structure and biological activity of insulin depends to a large extent on knowledge of the constitution of proteins. There is as yet very little experimental evidence to show how the peptide chains are joined together to form protein molecules. Wrinch advanced the hypothesis of a geometrically symmetrical system of diazine and triazine rings, arranged in so-called cyclols, and Wrinch and Langmuir[6] have applied it to insulin. This cyclol hypothesis is, however, based on very little experimental evidence, and can only be regarded, at least at the present moment, as an interesting speculation. The final answer to the question what structures of the insulin molecule are responsible for its biological activity must wait for an improvement in our methods of general protein chemistry.

[1] *Nature*, 1935, **135**, 591.
[2] *Biochem. J.*, 1934, **28**, 1592.
[3] *J. biol. Chem.*, 1937, **118**, 101.
[4] *Biochem. J.*, 1936, **30**, 809.
[5] Ibid., 1929, **23**, 1010.
[6] *J. Amer. chem. Soc.*, 1938, **60**, 2247.

HELIUM GAS IN DIVING

Human physiology places serious limitations on deep-sea diving. Divers have descended to great depths in "armour" which is rigid and jointed like the shell of a crustacean and does not allow the direct use of the hands. The chief enemies of the diver in a flexible suit are water pressure and the caisson disease which results from too speedy decompression. A sudden reduction in the pressure to which the diver has been subjected allows the nitrogen which has been dissolved in the blood to come out of solution in the form of bubbles. These either act as emboli or cause dehiscence of delicate tissues. The red blood cells also tend to agglutinate in compressed-air illness. The safe length of time for decompression is so long in proportion to the time spent under water as to make deep-water diving unproductive. At depths approaching 300 feet the diver is also liable to mental aberration, perhaps due to the depressant effect which may be exerted by nitrogen breathed under pressure. A new apparatus described by Edgar End[1] appears to solve most of the major problems of deep-sea diving. It is the invention of Max E. Nohl of Milwaukee and is self-contained, the diver carrying the components of his own atmosphere in steel cylinders on his back and therefore avoiding the danger of a trailing hose. He has sufficient air for fifteen hours. One of the cylinders is filled with a respirable gas mixture, which he admits into the diving suit to equalize the increasing pressure of the water; the others contain oxygen, which is admitted as required. The diver also wears a mask over his mouth and nose, and exhales through soda lime to remove carbon dioxide. Through a microphone in the mask the surface party can hear not only his conversation but also his respirations. The novel feature of the suit is in having a distension mixture separate from the oxygen supply, so that the use of oxygen is economized and the diver is not exposed to an atmosphere which is too rich in it. By reducing or temporarily interrupting the flow as he descends, by increasing the flow as he ascends, and by using distension mixtures in which the oxygen percentage, as determined beforehand, is reduced in accordance with the planned depth of the dive, the diver can provide himself with a breathing mixture in which the partial pressure of oxygen closely approximates to that of the atmosphere. If the diver has to cut his lifeline and telephone cable he first learns his decompression schedule from the surface party and then rises to the surface at a controlled rate, stopping for decompression when necessary. He carries a light manila line, which he attaches to his lead-soled shoes, and when he releases them they act as an anchor. He uses the line as a brake, and reads from markers on it how far he has ascended. A luminous watch on the instrument panel of his helmet enables him to time his stops. A particularly interesting feature of the suit is the use of a mixture of 80 per cent. helium and 20 per cent. oxygen, in which it is safe to decompress in about one-quarter of the time required with ordinary air. Moreover, the compressed mixture does not seem to cause much physiological change. The difficulty hitherto has been to carry enough of any artificial gas, and the new suit gets over the difficulty by its rebreathing apparatus. Decompression can be hastened by flooding the suit with pure oxygen, so that the inert gas in the blood will pass rapidly out by way of the alveoli. Mr. Nohl descended a year ago to a depth of 420 feet in Lake Michigan—equivalent to slightly over 410 feet in the ocean. The previous record dive was 344 feet, held by our Navy. He could probably have gone much deeper; and, unlike most diving dresses, his suit did not admit any water. He suffered from no distress, either physical or mental.

[1] *J. industr. Hyg.*, 1938, **20**, 514.

TREATMENT OF TRACHOMA

Derkac[1] has recently reported promising results in the treatment of cases of trachoma by a method of immunization. He transplants freshly excised active trachoma material into the skin of the arm; this tissue has not been damaged by chemical treatment and should contain more antigens than an extract. He obtained favourable results in adolescents. Derkac[2] has also tried tartar emetic in the treatment of this condition. In a preliminary report on fifty cases treated by the intravenous injection of 1 per cent. tartar emetic—2 to 3 c.cm. every second day in healthy adults and 0.5 c.cm. rising to 1 c.cm. in children every third day—he records distinct improvement, especially in corneal complications; he also found it helpful in superinfections by the Morax-Axenfeld bacillus. Julianelle and his associates[3] began to use tartar emetic in therapy after finding that it inactivated the trachoma virus *in vitro*. Experiments on monkeys revealed that trachoma material treated by this drug lost its infective properties. Forty cases were treated by different methods of administration of tartar emetic, and in this series, too, corneal complications in particular were favourably influenced. The most promising method seemed to be the intravenous administration of 1 per cent. tartar emetic in doses of 5 c.cm. on six successive days; on the eighth day 10 c.cm. were given, and this dose was repeated on the tenth, twelfth, fifteenth, nineteenth, twenty-second, twenty-fifth, twenty-eighth, and thirty-first days of treatment. Thus 120 c.cm., containing 1.2 grammes, were given over thirty-one days. There would appear to be no reason why this dosage should not be exceeded; one of the patients had a total of 1.4 and another of 1.6 grammes of tartar emetic. This general treatment can be supplemented by painting the fornices with the 1 per cent. solution once a day and instilling drops of the same strength three times a day. If more than a small quantity of the drug escapes into the subcutaneous tissues severe local reactions may occur. Muscular stiffness, particularly of the muscles of the lower leg and of the back between the scapulae, is another not uncommon complication; it is apt to appear in the later stages of the treatment, and is felt in the mornings but wears off during the day. Julianelle and his co-workers stress the fact that each patient has to be treated as a

[1] *Arch. f. Ophthal.*, 1937, **138**, 270.
[2] *Klin. Mbl. Augenheilk.*, 1937, **99**, 311.
[3] *Amer. J. Ophthal.*, 1938, **21**, 651.

special case and the dosage of tartar emetic has to be varied. The present dosage is still experimental, but this work is of significance as showing the possibility of influencing the corneal complications of trachoma, which respond but poorly to usual methods of treatment.

OESTRIN AND ATROPHIC RHINITIS

Wide and varied as are the therapeutic uses to which the sex hormones are already successfully put, the report that oestrin has given definite benefit in the treatment of ozaena and atrophic rhinitis might well evoke surprise and even scepticism. The relation between the nose and the sex glands is not an obvious one. But for some years scattered observations have been accumulating which suggest that such a relation does indeed exist, and beliefs as old as Hippocrates are at last receiving scientific confirmation. Over fifty years ago J. N. Mackenzie observed that in some women the nasal erectile mucosa became congested at the time of the menstrual periods. This phenomenon no doubt is responsible for that form of epistaxis traditionally regarded as a "vicarious menstruation." Recently A. S. Hoseason[1] has reported in this *Journal* two cases of vasomotor rhinorrhoea and asthma associated with menstruation. The elucidation during the last ten years of the predominant role of oestrin in the menstrual cycle and the production of this ovarian hormone in quantity have made it possible to study more carefully the relations of the nasal mucosa to the hormonal changes associated with menstruation. This study has been carefully carried out by Mortimer, Wright, and Collip.[2] These workers first investigated monkeys because the nasal mucosa in such animals is less liable to spontaneous variations and to rhinitis than is that of human beings. They find that injection of oestrogens into either male or female monkeys leads to nasal turgescence. The response is apparently due to direct sensitivity of the mucosa itself to the hormone, since it still occurs if the nasal tissue is transplanted to other parts of the skin surface. Following up this observation, it was next observed that in many pregnant women in the eighth and ninth months, when oestrin production is maximal, a recognizable degree of nasal turgescence was present. The discovery at about this stage of a large family of individuals all suffering from atrophic rhinitis prompted Mortimer, Wright, and Collip to try the effect of oestrin locally. In a recent paper they report on the treatment of sixty-nine cases of ozaena and atrophic rhinitis with oestrin. Of these many attended irregularly, but thirty-one women were persuaded to attend regularly: 1,000 I.U. of oestrin in olive oil was sprayed twice daily into the nose, and crusts which formed were removed by forceps twice a week. Improvement usually occurred in from two to six weeks and continued until in twenty cases (64.5 per cent.) there was complete disappearance of unpleasant odour, absence of crusts, disappearance of purulent secretion, and restoration of an almost normal pink mucosa. It was found that paranasal sinusitis was present in 17 per cent. of the women, and this had first to be treated by surgical or other means. The only untoward result of the treatment was the complaint of headache in about one-third of the cases during the first week, but reduction in the frequency of treatments usually stopped this. A number of the patients treated had complained of associated nerve deafness or otosclerosis. As some improvement in hearing was noted in the cases under treatment this aspect has been submitted to careful investigation, and it appears that some moderate degree of improvement also occurs in cases of otosclerosis submitted to treatment with oestrin. Collip and his colleagues consider that the nasal insufflation of oestrin is the most successful treatment for ozaena and atrophic rhinitis yet available, and confirmation of its efficacy has now come from an independent source.[3] This new use of oestrin has obvious points of similarity in principle with the use of the same substance for gonococcal vaginitis in children. In both its efficacy depends on the specific power of the hormone to change the nature of an epithelium. But whereas in the child's vagina an infected but otherwise normal epithelium is deliberately changed temporarily to a form abnormal for a child, in atrophic rhinitis the existing nasal mucosa is itself abnormal and hypoplastic, probably owing to some constitutional anomaly affecting this and other ectodermal tissues. In this case oestrin restores the mucosa to a more nearly normal state.

[1] *British Medical Journal*, 1938, **2**, 703.
[2] *Canad. med. Ass. J.*, 1936, **35**, 503 and 615; 1937, **37**, 445; 1939, **40**, 17.

POLIOMYELITIS AFTER TONSILLECTOMY

It has been known for some years that tonsillectomy is occasionally followed after an interval of about a week by an attack of poliomyelitis, which is then apt to assume the bulbar form. The virus, possibly present in the throat before the operation, presumably enters via the tonsillar bed, and since it is known to travel to the central nervous system in nerves, the point of arrival from this site will be in the medulla, which tallies with the distribution of the paralysis. From the usual portal of entry, which is believed to be the olfactory mucosa, wider dispersion has to take place in the central nervous system before paralysis is produced, and its distribution is hence more varied. A letter from Dr. Alfred E. Fischer in this issue of the *Journal* draws attention to observations[4,5] made by himself and Dr. M. Stillerman on the occurrence of bulbar poliomyelitis after tonsillectomy, and supports the hypothesis put forward by Drs. Anderson and Dixon,[6] that the virus reached the brain via the tonsil bed in the two cases of acute bulbar paralysis recently described by them in these columns. Fischer and Stillerman recorded thirteen cases of acute poliomyelitis after tonsillectomy and adenoidectomy. The disease appeared from ten to twenty-two days after the operation and in nine of the thirteen cases was of the bulbo-encephalitic type. This

[3] *Laryngoscope*, 1938, **48**, 699.
[4] *Amer. J. Dis. Child.*, 1937, **54**, 984.
[5] Ibid., 1938, **56**, 778.
[6] *British Medical Journal*, 1938, **2**, 1077.

is a deduction from clinical experience, but it now receives experimental support from work by A. B. Sabin,[7] who has succeeded in infecting monkeys by the tonsillar route. In experiments strictly comparable with human conditions the results were mainly negative. Inoculation of the tonsillar bed after tonsillectomy in monkeys whose nasal mucosa was protected by spraying with zinc sulphate was not followed by the disease. On the other hand, poliomyelitis was produced by injecting virus beneath the mucosa in the tonsillar region in quantities which were without effect when introduced subcutaneously; it therefore seems justifiable to conclude that this region is for some reason a favourable portal of entry for the virus. When so produced the attack was bulbar in type, the parallel with human cases being to that extent exact, and virus was absent from the olfactory bulbs, showing both that invasion did not proceed by the usual route and that the virus is not, as has sometimes been suggested, eliminated by this route. These observations not only confirm the conclusions reached from clinical experience but suggest the important safeguard mentioned by Dr. Fischer. If minor operations on the upper air passages such as tonsillectomy favour invasion by the virus of poliomyelitis, and are liable to be followed by a peculiarly dangerous form of the disease, they should be avoided at times when poliomyelitis is prevalent.

GUY'S HOSPITAL DENTAL SCHOOL

The annual clinical meeting of Guy's Hospital Dental School was held on March 4, and a large number of past students returned to renew old acquaintanceships and to witness demonstrations of modern procedures by members of the staff. These demonstrations were given morning and afternoon in every room of the dental department and in the theatres. The announcement was made in the course of the proceedings that Guy's was to be the first of the teaching hospitals to appoint a whole-time dental research fellow. The appointment has still to be confirmed by the University Senate, but it is understood that it will be filled by a biochemist, who will work at the school and have every facility and help possible in the investigation of the causation and prevention of decay of teeth and in work on dental diseases in general. The school was also celebrating the jubilee of its foundation. Fifty years ago, in February, 1889, one dental student—Mr. Montagu Hopson, who is still active—presented himself; by April of that year the nucleus of a dental teaching staff was gathered together; May saw the arrival of a second student, and by October there were six. This year the total number of students is 367, about half of whom are senior students working in the conservation room. This number represents more than half the total of dental students in the London schools, and makes Guy's the premier school not only in London but in the Empire. Very important work is being done in the children's department, where there are over 1,200 children under treatment for regulation of teeth and correction of facial deformities. The treatment with the average child occupies anything from six to twelve months, and the children are retained in the department for at least twelve or eighteen months after cure to be watched. The annual number of attendances of patients has risen to over 101,000, and last year the work performed included more than 29,000 fillings, 30,000 extractions, and 2,100 dentures, and 6,500 patients were treated in the dental *x*-ray department. One line of research recently started at the school is an investigation by means of a petrological microscope into the degree of calcification of the enamel formed before and after birth. The assumption has always been that the enamel formed before birth was likely to be better than that which is formed after the child is born, but some work in China on mothers suffering from osteomalacia points to a rather different conclusion. The investigators at Guy's are trying to discover whether in an urban population the degree of calcification of children's teeth varies in a manner corresponding to the nutrition of the mother. It is also hoped to get a reliable interpretation of the success or otherwise of different kinds of diet.

[7] *J. Amer. med. Ass.*, 1938, **111**, 605

DR. ANDERSON'S WEST INDIES TOUR

Dr. Anderson has returned from his tour of some of the West Indies Branches which he undertook at the request of the Council. Accompanied by Mrs. Anderson, he visited Barbados, Grenada, Trinidad, and Jamaica, and in each island addressed meetings of the profession on the work of the British Medical Association. He discussed with members of the Branch, both individually and collectively, the medical problems peculiar to the locality, and was able in the short time at his disposal to see something of the working of the medical services and to discuss with the members of the Branch Councils the nature of the medical evidence which had been or was to be submitted to the Royal Commission. Dr. Anderson has come back very much better in health and with the happiest recollections of the warm welcome he received and with great hopes that his visit will have valuable results in strengthening the ties between the Branches in the West Indies and the parent body.

G.M.C. ELECTION

Dr. H. Guy Dain has been returned unopposed as a Direct Representative of the profession in England and Wales upon the General Medical Council for a period of five years from April 27, 1939. Dr. Dain has already served on the General Medical Council since April 27, 1934. He was selected by the Divisions of the B.M.A. in England and Wales to receive the support of the Association.

We regret to announce the death at the age of 90 of Mr. Cuthbert Hilton Golding-Bird, consulting surgeon to Guy's Hospital, who was one of the oldest Fellows of the Royal College of Surgeons of England.

SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

ANAL FISSURE

BY

W. B. GABRIEL, M.S., F.R.C.S.

The successful management of a case of anal fissure depends so much on accurate diagnosis and on the ability to make a satisfactory examination that a few words must first be said on these important preliminaries. A fissure of the anus should be suspected whenever a patient complains of severe anal pain of a burning or cutting nature which is felt at or shortly after defaecation and lasts for a variable time. The only other conditions which cause severe pain in this region are: (1) an acute tense anal haematoma, (2) an acute abscess, (3) the impaction of a piece of bone or other sharp foreign body in the anal canal within the grasp of the anal sphincters, (4) a carcinoma involving the anal canal and anal margin. According to the length of the history, some idea will be gained whether the condition is acute or chronic, but it is remarkable how often patients report a recent exacerbation of anal pain as if it were a new thing, whereas in reality they have suffered this at intervals for many months or years.

Diagnosis

The diagnosis of anal fissure is made in the first instance by inspection. Separation of the buttocks and anal margin permits the lower end of a fissure, or sometimes even its whole extent, to be seen. Situated posteriorly as a rule, and only rarely laterally and anteriorly, a fissure is often indicated by a slightly raised lip of skin at its lower border; in chronic cases this becomes enlarged until it forms the "sentinel tag," a prominent bright-pink external tag of skin which is often flattened from side to side in a very characteristic way.

The depth of a fissure can often be fairly well estimated by inspection: the shallow bright-red surface of a recent fissure is in marked contrast with a deep chronic fissure, the base of which often has an indolent greyish appearance; the transverse fibres of the subcutaneous external sphincter are frequently seen traversing the base of a chronic fissure. A discharge of pus from the fissure indicates active infection at its base, and the presence of a short dorsal fistula is evidence of a previous complication of the same nature.

Palpation of the anal margin with a forefinger will show at once if the subcutaneous external sphincter is in spasm, and then an attempt should be made to introduce a finger. A digital examination of the anal canal and rectum is advisable in almost all cases, and if suitable local anaesthetics are used it is quite feasible to do this without causing pain. A small moist pledget of cotton-wool is dipped into decicain crystals (Bayer) and laid on to the surface of the fissure for a few minutes. In addition to this an ointment of 3 per cent. decicain in white vaseline may be used as a lubricant, and by massaging this gently into the anal canal a satisfactory examination can almost invariably be made. The points which are particularly to be noted digitally are the characteristic signs of chronicity—induration at the base or lower border of the fissure and a fibrous contracture of the subcutaneous external sphincter. A recent abscess in relation to the fissure can often be felt as a small indurated mass the size of a walnut when the tissues at the anal margin are palpated between the forefinger in the rectum and the thumb outside (bidigital method). A fibrous polyp or hypertrophied papilla in the anal canal can be made out digitally and confirmed by the passage of a small proctoscope.

Any other associated rectal condition, such as internal haemorrhoids or proctitis, should be recognized, and every effort must be made to exclude a coincident neoplasm of the rectum, whether innocent or malignant. A child's sigmoidoscope such as Vann's (external diameter $\frac{5}{8}$ inch) gives a view up to eight inches, and Morgan and Officer's latest pattern (external diameters, $\frac{1}{2}$ and $\frac{5}{8}$ inch), with its admirable magnifying attachment (Genito-Urinary Co.), gives a splendid view up to 25 cm. Either of these sigmoidoscopes can be passed readily in the majority of fissure cases after anaesthetizing the fissure by a surface application of decicain as described.

Palliative Treatment

Small superficial fissures will heal satisfactorily if treated on palliative lines. The stools are rendered soft by a morning and evening dose of mineral oil: an olive oil and gruel enema may be needed at the outset if a constipated faecal mass is present in the rectum. Much relief is experienced if the patient sits in a hot bath morning and evening. Locally, in the acute stage, the patient is given a 3 per cent. decicain ointment, which, when inserted digitally, quickly relieves pain and spasm. After a few days the ointment may be changed to zinc and castor oil, cod-liver oil and vaseline, or a scarlet-red ointment. Topical applications to stimulate healing are helpful, the usual one being pure ichthyol, which is applied on a wooden applicator. A silver nitrate stick produces more effect, but its application is very painful unless the fissure is first anaesthetized by a subcutaneous injection of novocain or procaine beneath it.

Injection

Injection of the external sphincter with an anaesthetic solution in oil is an excellent method of dealing with a superficial fissure accompanied by a marked degree of sphincter spasm. Two solutions commonly used are "percaine oily solution" (Ciba Ltd.), which contains 0.5 per cent. percaine and 1 per cent. phenol in almond oil, and proctocaine (A. & H.), containing butesin (6 per cent.) and procaine base (1.5 per cent.) in almond oil.

Method.—A warm dry sterile 10-c.cm. syringe is filled with the warmed solution (two 5-c.cm. ampoules) and a 1½ or 2 inch No. 20 Record needle is firmly attached. With the patient lying on his right side with the knees drawn up, a small intradermal wheal of 1 per cent. aqueous procaine is made with another syringe and a fine hypodermic needle about an inch posterior to the anal margin. The operator then inserts his left forefinger into the anal canal as a guide, and the oily solution is injected deeply into the sphincter through the wheal; the needle is passed first on one side, then on the other, and care is taken to alter the direction of the needle slightly so that the solution is distributed evenly; in other words, "pooling" must be avoided (Fig. 1).

It need hardly be said that strict aseptic precautions are to be observed in giving this injection, not only in the

sterilization of the syringe and needle and the preparation of the skin, but also in avoidance of infection of the puncture from the anus during the injection. Puncture of the anal canal with the needle point would be likely to be followed by disastrous consequences, and at no time during the injection should the needle be so close that it can be felt with the finger in the anal canal.

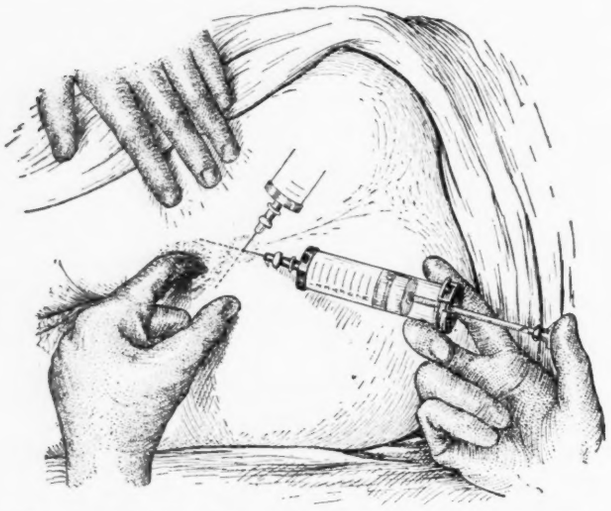


FIG. 1.—Injection of oil-soluble anaesthetic in the treatment of anal fissure.

The result of the injection is a relaxation of the external sphincter ani which usually lasts in some degree for several weeks. A few minutes after the injection has been completed it will be found that the fissure can be displayed fully, without causing pain, by separating the anal margins, and an application of pure ichthyol is given to it by means of a wooden probe. For the week or two following the injection the patient is instructed to apply some 3 per cent. decicain ointment digitally to the anal canal night and morning, and particularly before each action of the bowels. Spasm and pain being relieved, the fissure usually heals quickly; the application of ichthyol may be repeated with advantage two or three times a week until the fissure is seen to be healed. Before the patient is discharged it should be possible to pass a finger into the rectum without causing pain or opening up the fissure in the least.

Surgical Cure

It should be generally recognized that there is little prospect of permanently curing a chronic anal fissure except by an accurately planned and well-executed surgical operation. The objects which can be achieved with certainty by this and by no other method are: (1) removal of the sentinel tag or raised lip of skin, which, being situated at the lower extremity of the fissure, acts as a mechanical hindrance to drainage; (2) division of the spastic and contracted subcutaneous portion of the external sphincter, which in the typical chronic fissure case forms a fibrous ring round the anal outlet. The operation can be carried out under local, low spinal, or general anaesthesia. In some patients who have reached the limits of nervous prostration from long-continued pain a preliminary intravenous injection of evipan or pentothal is advisable, the anaesthesia being carried on with gas, oxygen, and a minimum amount of ether.

With the patient in the lithotomy position a triangular incision is made with a scalpel as indicated in Fig. 2; the triangle is approximately isosceles in shape, the sides being about 1¼ inches in length. The cut having been made through skin into the subcutaneous fat, the flap is raised up from its base forwards with toothed dissecting forceps and scissors. When the apex is reached a little traction is applied and the scissor cuts are made from both sides in turn until the triangle of skin, together with the sentinel tag and lateral margins of the fissure, is quite free and can be removed. If a finger is passed into the anal canal at this stage the contracted subcutaneous portion of the external sphincter is felt traversing the wound, and this part of the muscle is next divided with straight scissors, until the forefinger can be passed in without feeling any trace of the ridge or bar caused by its contracture. The internal sphincter and remaining portions of the external sphincter may with advantage be given a slight lateral stretching by means of the two forefingers introduced into the canal and gently separated.

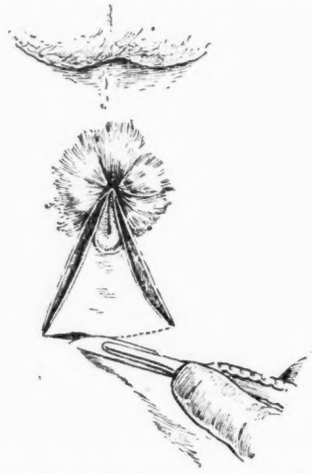


FIG. 2.—Excision of chronic anal fissure (half scale).

Careful search is made for a fibrous polyp at the upper end of the fissure, and if hypertrophied anal papillae are present they should be excised with scissors or a diathermy knife or snare after crushing their bases. Internal haemorrhoids must be removed by ligature and excision only if they are of the third degree and therefore likely to interfere with the drainage of the fissure wound. An application of tannic acid (40 per cent. in aqueous 1 in 1,000 flavine lotion) may with advantage be made to the surface of the wound, and the operation is completed in the usual way by injection of sterile vaseline into the rectum from a collapsible tube; a small piece of rubber tube is inserted and a gauze dressing moistened in dettol lotion is tucked into the anal canal, the chief object being to keep the wound margins apart.

Post-operative Measures

Much care is required subsequently to make sure that the external drainage is maintained. The gauze inserted at the operation is not removed until the third post-operative day; a short evipan anaesthesia may be given, and after the gauze has been withdrawn and the wound irrigated it is carefully inspected to see that the outer part—that is, the base of the triangle—has not fallen together. In stout subjects particularly there is a tendency for this to happen, and it must be met by a little lateral stretching until the wound surfaces have separated and the triangle is thus properly re-formed. A pledget of wool held in dissecting forceps should be swept down the centre of the wound, from the apex in the anal canal down to the base, to prove that the original floor of the wound is still presenting; and if the patient has had

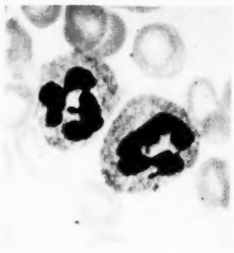


FIG. 1

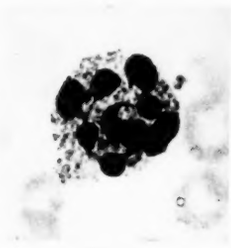


FIG. 2

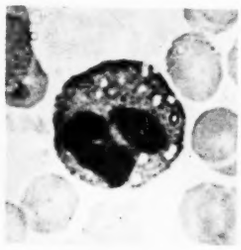


FIG. 3

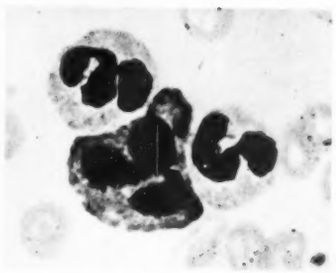


FIG. 4

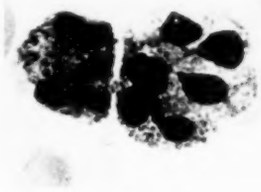


FIG. 5

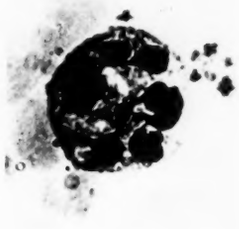


FIG. 6

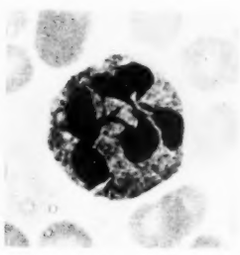


FIG. 7

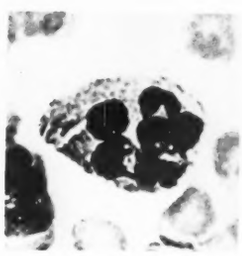


FIG. 8

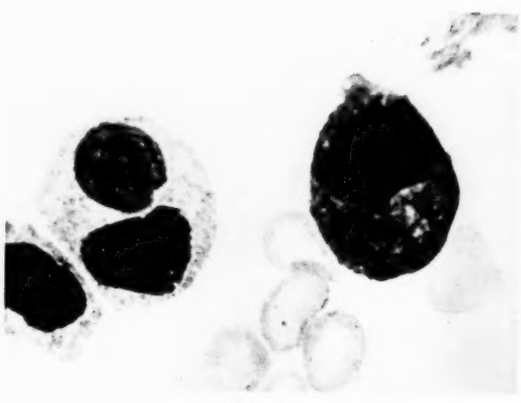


FIG. 9

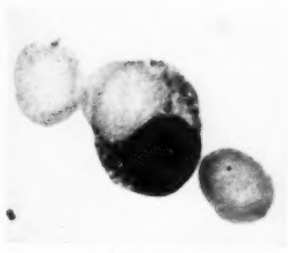


FIG. 10

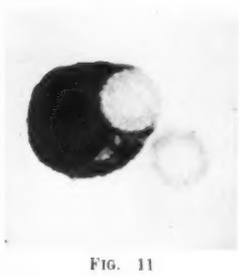


FIG. 11

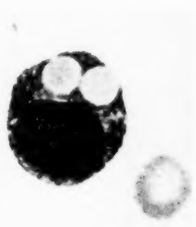


FIG. 12

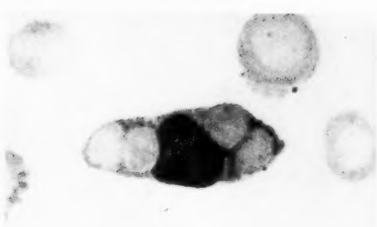


FIG. 13

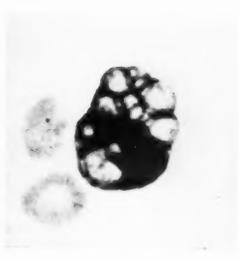


FIG. 14

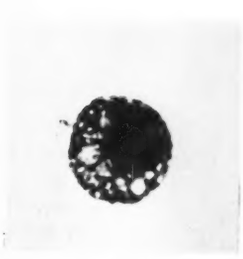


FIG. 15

Macropolycytes in Health.—FIG. 1: Two normal polymorphs. FIG. 2: Typical macropolycyte; nine lobes; diam. 18μ. FIG. 3: Eosinophilic macropolycyte: diam. 18μ. FIG. 4: Basophilic macropolycyte (macromast cell) with two neutrophils; from a case of leprosy. FIG. 5: Macropolycyte; diam. 21μ. FIG. 6: Macropolycyte; diam. 21μ. FIG. 7: Macropolycyte; diam. 19μ. FIG. 8: Macropolycyte; 23$\times$16μ. The cells shown in Figs. 1–3 and 5–8 are from Case I.

Erythrophagocytosis following Blood Transfusion.—FIG. 9: Two large macrophage cells. FIG. 10: A red cell in the process of ingestion. FIGS. 11–14: Macrophages with ingested red cells. FIG. 15: The ingested red cells are broken down to globular particles and the macrophage has rounded off.

All stained Giemsa; magnification, 1,000 diameters (approx.).

J. HARDIE NEIL, W. GILMOUR, AND F. J. GWYNNE: ANATOMY OF THE BRONCHIAL TREE

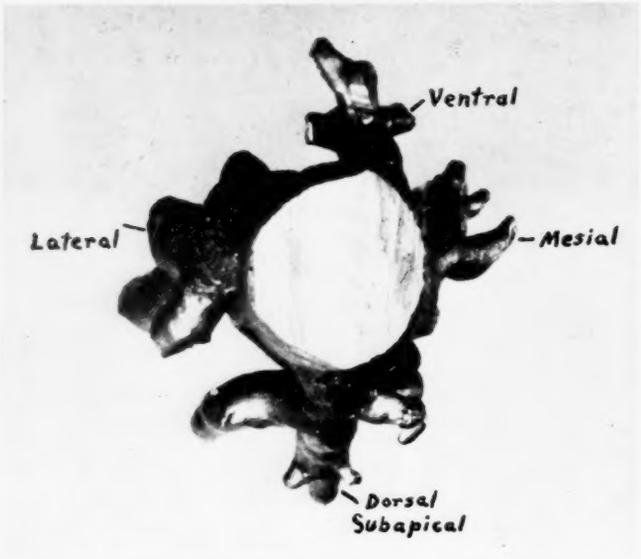


FIG. A.—Cross-section of left bronchial stem of a pig, at the level just above the homologue of the subapical bronchus.

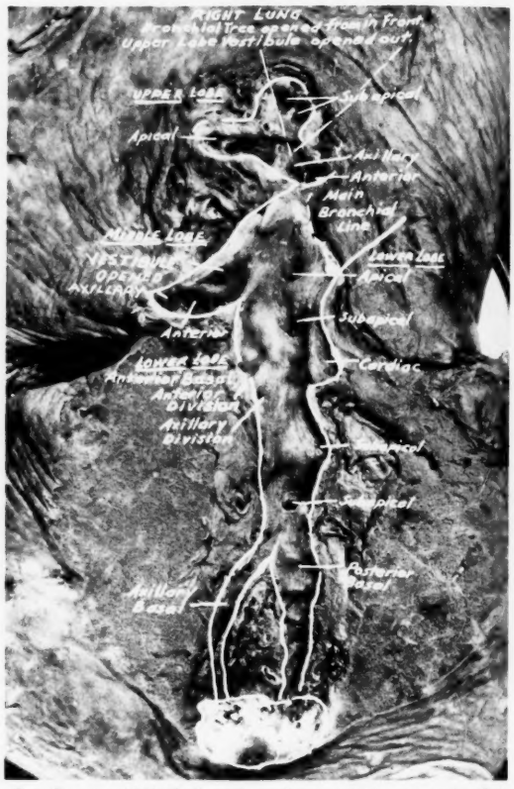


FIG. B.—A pathological specimen from a child aged 4 who died of bronchopneumonia, lung abscess, and empyema following measles. There are shown the orifices of three subapical segmental bronchi which are the variants of the bronchial tree.

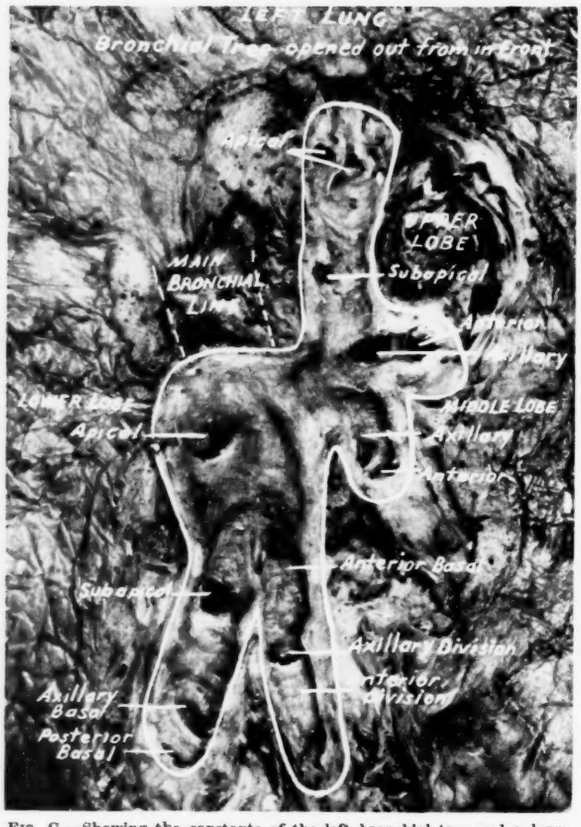


FIG. C.—Showing the constants of the left bronchial tree and a large subapical bronchial orifice.

C. C. HOLMAN: PROGRESSIVE STREPTOCOCCAL ULCERATION

CASE II.—Condition on November 1, 1938.

J. S. RICHARDSON AND W. R. S. DOLL: JUVENILE FORM OF THE ADRENO-GENITAL SYNDROME

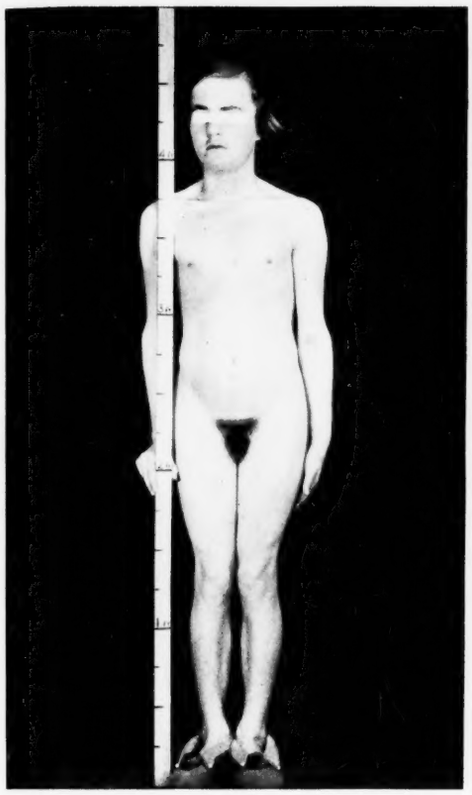


FIG. 1.—Photograph showing the patient's physical development.

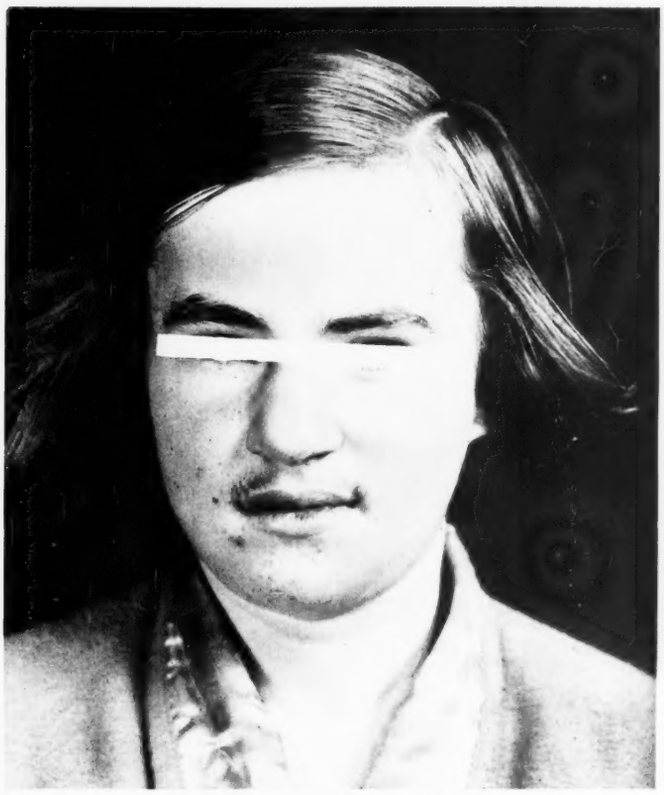


FIG. 2.—Showing tendency to facial acne vulgaris and hirsutism.

FIG. 3.—Photograph of the external genitalia.

IVOR RADNOR: POLYARTICULAR ARTHRITIS TREATED WITH OESTROGENIC HORMONE

FIG. 1.—Photograph taken on September 30, 1938, one week after start of treatment

FIG. 2.—Photograph taken on January 19, 1939.

E. H. HUDSON: SINGLE LARGE CYST OF LUNG SIMULATING HIGH-PRESSURE PNEUMOTHORAX

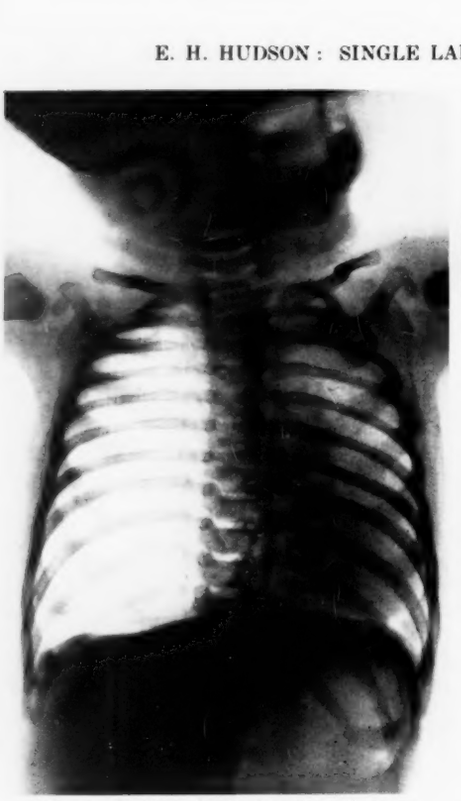


FIG. 1.—Radiograph showing the pulmonary remains at the apex and the base. August 13, 1936.

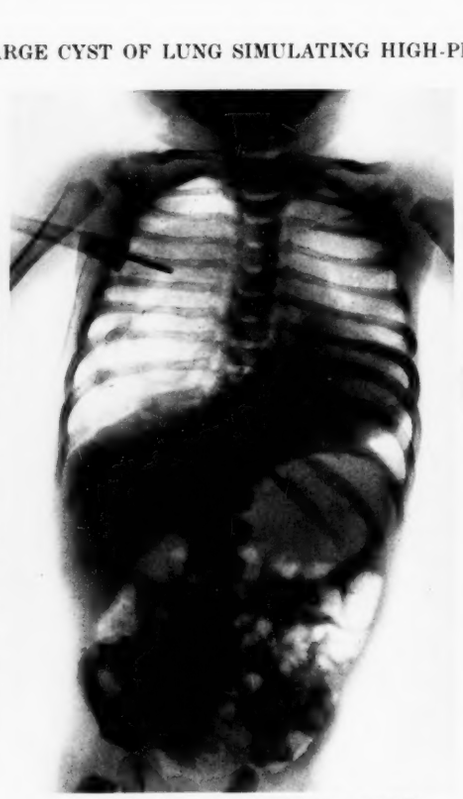


FIG. 2.—Radiograph showing the partially expanded lung and a pneumothorax. September 12, 1936.

FIG. 3.—Radiograph taken on September 24, 1936.

G. L. A. KONSTAM AND FRANKLIN G. WOOD: TWO CASES OF PICK'S DISEASE

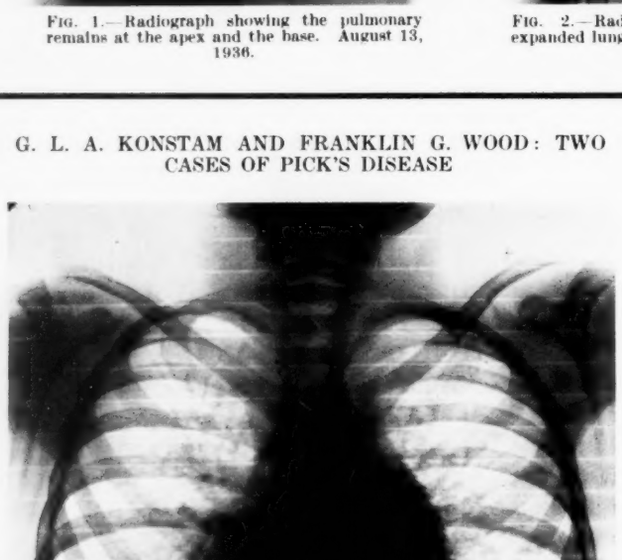
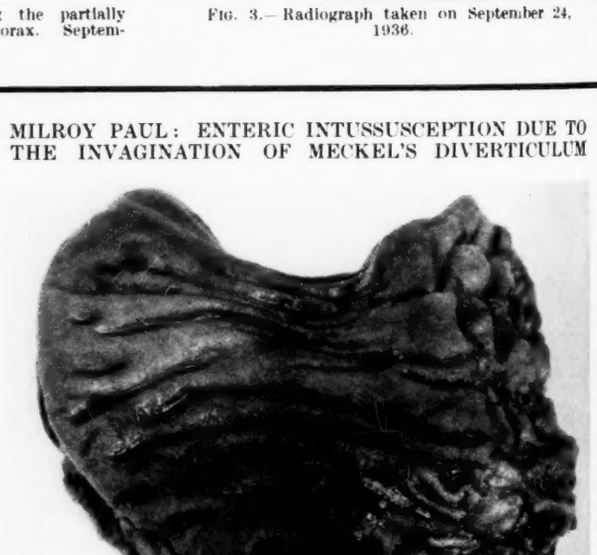


FIG. A.—Kymogram of Case 1 before operation, showing the deposit of calcium on the lateral and inferior borders of the heart. The pulsations are absent at the apex of the left ventricle, and are minimal at the right border.

MILROY PAUL: ENTERIC INTUSSUSCEPTION DUE TO THE INVAGINATION OF MECKEL'S DIVERTICULUM



Inverted Meckel's diverticulum in lumen of resected gut.

evipan a forefinger should be passed in and out to confirm that the wound is smooth and open. A corner of fine dressing gauze moistened in eusol or diluted Milton lotion must then be passed into the canal with sinus forceps and arranged over the wound surface: in order to render the next dressing more easy for the patient the surface of gauze adjacent to the wound may with advantage first be given a smear of cod-liver oil and vaseline ointment. When the gauze is actually being tucked in it is essential to have an assistant to retract one buttock and help to hold the wound open—it is usually impossible in the early stages to do this dressing single-handed.

Subsequent dressings are done twice daily and are rendered less painful by the patient having a hot bath beforehand. In very sensitive subjects a decicain ointment may be used on the gauze for the first few days, and the oral administration of luminal or bromides is often extremely helpful during the first week after operation. In all cases it is undoubtedly beneficial to carry out a regular dilatation of the anal canal: this is done by means of the St. Mark's Hospital dilator, the outer end of which has a diameter of one inch (Fig. 3). This

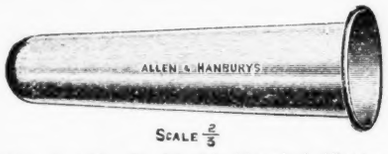


FIG. 3.—The St. Mark's Hospital dilator.

dilator, warmed and lubricated with a zinc and castor-oil cream or a cod-liver oil and vaseline ointment, is passed at each routine dressing night and morning from the fourth post-operative day onwards. By this means the inner margins of the wound are kept separated, and the dilatation serves to re-educate the patient in sphincter relaxation, with the accompanying desirable state of comfort which fissure cases have invariably lost by the time surgical treatment is sought.

The rate of healing varies a good deal in different subjects; if the granulations become indolent or protuberant their surface should be pared down with scissors and touched from time to time with a silver nitrate stick or crystal of copper sulphate. In eighteen to twenty-one days after operation the patient will be fit for discharge home; the inner extremity of the wound will be healed over or nearly so, and there will still be a residual external wound, oval or triangular in shape. Digital examination now should prove the anal canal to be smooth and free from spasm so that a finger is admitted painlessly. The patient takes a St. Mark's dilator on discharge and is asked to pass this twice daily for the first week or two and then at increasing intervals. All forms of active exercise will in due course be permissible, but for the first few weeks after the wound has healed running and riding should be prohibited, as there is some risk of the tender epithelium splitting in the middle line; if this should happen the patient will notice slight soreness and bleeding. The treatment is to touch the open surface with a silver nitrate stick; and after a few days' inactivity, with cod-liver oil, desitin, or scarlet-red ointment as a dressing, the healing will again be complete.

The criterion of cure is the restoration of a smooth and permanently healed anal canal which will admit a finger and dilator without pain or opening up the scar, and allow the passage of normal formed stools without the least discomfort.

SURGERY OF THE GALL-BLADDER

PROFESSOR GREY TURNER'S SECOND LECTURE

The second of Professor Grey Turner's Lettsomian Lectures on the surgery of the gall-bladder and common bile duct was delivered before the Medical Society of London on March 1. Professor Turner mentioned that immediately after delivering his first lecture he returned to his old city of Newcastle and there ran across an old patient on whom he had operated for an acute condition of the gall-bladder twenty-eight years ago. All that had been done was to open the gall-bladder, remove the stones, and drain. The mucous membrane was found on operation to be gangrenous in patches and there was much surrounding oedema and inflammation. The patient made a good recovery, and there had been no recurrence of symptoms during the long intervening period. Such a case was a useful reminder to those younger surgeons who unless they attempted in all cases to carry out a cholecystectomy felt that they were not doing their best for their patients.

One of the newer methods advocated and practised in recent years was electrocoagulation. It deserved serious consideration, and he had no doubt that it had a large field of usefulness. But in this method it was considered essential to expose and ligate the cystic duct in order to avoid a biliary fistula; there were cases in which the exposure of the neck of the gall-bladder and the cystic duct was very difficult, and although many surgeons had been able to carry out the operation successfully there might yet be many disasters associated with it. It was stated that for dealing with an inflammatory condition that had extended beyond the gall-bladder into the liver no method was so likely to cut the process short as diathermic destruction. But having watched these patients and their after-histories he could say with confidence that, while keeping an open mind towards new methods, the recuperative power of Nature should not be under-estimated. In his opinion there were some conditions in which drainage of the gall-bladder held out a better prospect than mere excision. When dealing with large numbers of very small stones it was better from a therapeutic point of view to establish drainage either through the gall-bladder itself or through the duct. They must not destroy the gall-bladder and feel that a complete operation had been done.

His own personal figures for operations to the end of 1938 were as follows:

	Operations	Deaths	Percentage
All cases	1,040	61	5.86
Limited to gall-bladder	790	28	3.55
Common duct involved	220	29	13.18
This series had runs of	162	2	1.23
	56	1	1.78
	50	1	2.00
	268	4	1.49

The figure of 3.55 per cent. included all kinds of inflammatory conditions, many of them associated with complications which might carry serious risks. Although the position was accepted that in the great majority of cases cholecystectomy was probably the best operation, there were occasions when it ought to be recognized that drainage was better. To the young surgeon he would say: "When in doubt, drain."

Recurrences and Secondary Operations

Late recurrent attacks were often due to transitory inflammation of the biliary tract. This view was based on the further after-history or on the fact that at another operation nothing of a gross nature was found to explain the recurrence. The liver, again, was an extremely sensitive organ, subject to great variation in size and vascular content; it ought to be regarded not only as a secreting organ but as a great vascular "side-track," so to speak,

of the circulatory apparatus, and not infrequently on re-operation in these cases evidence had been discovered of some gross process in connexion with the lymphatic structure of the liver rather than with the ducts.

Early symptoms of recurrence were taken to suggest further stones, but it was important to bear in mind that every now and then, after a successful operation for stones in the gall-bladder, whether the gall-bladder was removed or only drained, the patient might have typical attacks of gall-stone colic, and the assumption when such attacks occurred was that a stone or stones had been left behind. It might well be that the trouble was due to a gall-stone which had been misplaced in the manipulation, the passage of that stone causing the colic. He was equally certain that some of these cases were due not to a gall-stone but to a clot of blood, again as the result of the necessary manipulations. The point he wanted to make was that the patient might have an attack even of severe colic, which was not necessarily the occasion for further operative intervention. The "left-overs" might sometimes be passed of their own accord. But repeated attacks of course demanded operation.

The number of patients who came to secondary operation was five times greater after drainage than after removal of the gall-bladder. It was not fair to conclude from that, of course, that in any such proportion of cases the proper operation had not been carried out, or that the patients would have been cured if cholecystectomy had been done. Often in these cases a second operation was no reproach to the procedure adopted in the first instance. It had been suggested that secondary operations were always of great difficulty and magnitude and to be avoided at all costs. That was rather unfortunate teaching. Anybody who had been properly trained in abdominal surgery and had had the opportunity of seeing some of these admittedly difficult cases operated on ought to have no difficulty in carrying out such secondary operations, which, done at leisure and with the patient properly prepared, ought to have much more chance of success than the operation done under more or less emergency conditions, with the possibility of complications which sometimes might be fatal.

The patients who had the shortest pre-operative history made the best and most lasting recoveries. That was a platitude, but it was worth stating in view of the fact that nowadays patients with biliary disease were coming forward at a much earlier stage than formerly, and he was glad to think that it was now becoming recognized that surgery was undoubtedly the proper treatment for gall-stones. The less secondary damage that had been done by the presence of a gall-stone the better the prospects of recovery. It had been suggested that many patients operated on for gall-stones died from degenerative diseases of the cardiovascular system. That might be so; he did not think that surgeons could be expected to confer immortality on their patients, but if so it was only an argument for earlier operations.

Aetiology and Diagnosis

After showing a photograph of one of the largest gall-stones in his experience (it weighed 5 oz., measured 7 in. in circumference, and was impacted in the transverse colon, causing acute obstruction, in a man aged 80, who recovered after it and another large gall-stone were removed), Professor Turner said that he could express no opinion on the causation of gall-stones. Those who had had the opportunity of making post-mortem examinations must be familiar with the cases in which gall-stones were scattered throughout the liver. It was probable that there was such a condition as a gall-stone diathesis, not always to be influenced by the method, necessarily comparatively crude, of removing the stones. There were cases in which the disease was localized in the gall-bladder and for many years caused little or no trouble, and others in which the common duct was involved, and a systemic disease made itself evident, upsetting the metabolism, and being often attended by grave sepsis. The late Sir David Wilkie was inclined to attribute gall-bladder conditions to a more or less generalized infection, which was likely to involve the appendix and perhaps the duodenum, as well as the gall-bladder. Probably in most cases where there was disturbance or disease of the gall-bladder, whether it was only inflammatory or associated with obstruction, there was likely to be some disturbance of the liver and of the pancreas. That disturbance might be more or less of a reflex nature or it might be a gross secondary infection. Among the numerous interesting illustrations with which the lecture was accompanied was one showing the general dilatation of the biliary tree which occurred in certain circumstances following stricture in the common duct.

Professor Turner then went on to speak of the symptoms which gall-stones might produce, and applied a quotation from Robert Louis Stevenson: "Sometimes it leaps suddenly upon its victims like a Thug, and sometimes it lays regular siege and creeps upon their citadel during a score of years." The most surprising thing was that a patient might have a large gall-stone for years without symptoms. There were many methods by which the diagnosis of gall-stones might be reached. The ordinary physical signs should not be neglected. Although in many cases of the more chronic type it was impossible to do more than make a shrewd guess at the diagnosis, in acute cases it was worth while to remember that the ordinary examination, especially if that examination had extended over a day or two, would enable the condition to be elicited. Gross mistakes were not unknown. He referred to cases operated on for gall-stones in which, although the gall-stones were present and were undoubtedly causing gross pathological changes, they proved not to be the cause of the symptoms for which the patient came for relief, such symptoms being due to an undetected carcinoma in the colon. Obstructive changes due to the compression of a large stone in the gall-bladder were not infrequently found. This was one explanation of the type of jaundice which might be a complicating factor in the case.

Modern Surgical Methods

With the aid of lantern-slide illustrations Professor Turner discussed the features of the more usual and of the rarer cases, and added finally a few remarks about the common duct and the improved surgical methods in connexion therewith. Not infrequently a stone which was small was none the less potent for evil, and made all the difference between the patient who was cured and one who was not relieved as a result of possibly a serious surgical intervention. On account of the difficulty of removing and, indeed, of locating the small stones and the danger associated with these operations, certain surgeons had deliberately advocated the view that it was safer to make a direct anastomosis between the common duct and the duodenum. Professor Pribram in cases of that kind opened the common duct, and when he could not remove some small calculus or fragment of calculus without undue risk he stitched the common duct very firmly round about a catheter and later injected drops of ether into the duct in the hope that the stones would be dissolved. The method was often very successful.

Some patients with biliary trouble, with or without stones, were not cured after external drainage of the gall-bladder, the drainage not being thorough enough, and in some of these cases it was thought too drastic to remove the gall-bladder if there were only a few stones. The operation known as cholecysto-choledochotomy had been suggested in some of these cases. The lecturer added a remark about gall-stone operations and cardiac disease. He did not see why patients with cardiac disease should not be operated on. He had found that, of course with adequate care and preparation, such cases could often be brought to a successful issue, with great advantage to the patients' general health.

Professor Turner's third and last lecture was delivered on March 6, and a report will appear in the next issue.

MEDICAL RESEARCH COUNCIL

REPORT FOR 1937-8

The first part of this notice of the annual report of the Medical Research Council for the year 1937–8[1] was published last week at page 462.

Pulmonary Disease and Dusts

The Medical Research Council is most directly concerned with the question of the best methods of promoting research work, but it cannot remain uninterested in the practical application of the new knowledge acquired in a hundred laboratories and research units. The practical applications, in the industrial fields for example, seem to be more numerous and significant every year. One matter in which the Council has been interested is the evidence that coal-miners are subject to chronic pulmonary disease of a disabling nature which does not come within the accepted definition of silicosis. Clinically it resembles silicosis, but radiologically it is different. The investigation of this subject started in 1936, it is necessarily slow, but there is every reason to hope that interesting new information will be forthcoming when the whole of the evidence now being carefully collected is available for review. The aetiology of pulmonary industrial diseases is also being studied at Cardiff, where the nature of the lung lesions induced by prolonged inhalation of sandstone, slate, and anthracite dusts is being studied. The preliminary results indicate that the dusts produce much more marked lesions when killed tubercle bacilli as a source of tuberculous toxins are simultaneously inhaled. At the National Institute experiments have been continued on the effects of dust in producing lung cancer. Suggestions have been made of a possible deleterious action of smoke in gases from the heavy-oil motors now used on certain public vehicles. The soot from the exhaust pipes has been tested, but no evidence has been obtained of any important carcinogenic properties.

Treatment by Radiation

Another field in which the Council has had special responsibilities is in the control and co-ordination of clinical and experimental researches into the curative possibilities of radium in cancer. Some discussion on the subject of radium beam therapy appears in the report. This method is capable of destroying accessible primary growths, and the main problem that awaits solution is the method of ensuring the destruction of secondary malignant deposits in the tissues. Work has recently been started with a 10-gramme unit, and it is proposed shortly to make a comparative study of the relative values of radium beam therapy and of high-voltage *x* rays in the treatment of cancer. Meanwhile there has arisen the question of neutrons and temporarily radio-active substances, the result of the discovery and development of the cyclotron at the Berkeley University, California. A member of the Council's staff, Dr. F. G. Spear, is at present in California, and his report is awaited.

Investigations of the uses of ultra-short high-frequency waves have been continued at the London Hospital. It is stated that no evidence has so far been obtained to support the claims of certain workers that these waves have a more specific biological action than that due to the production of heat. At the Strangeways Research Laboratory, Cambridge, a large investigation is proceeding on the biological effects of radiation. Some work on the effect of gamma rays on cell division in the normal tadpole has been completed, and the results confirm the conclusion that the degeneration seen after relatively small doses of radiation is correlated with the presence of potentially dividing cells which are unable to accomplish mitosis owing to damage caused by the exposure and break down on attempting division.

[1] Report of the Medical Research Council for the Year 1937–8. Cmd. 5939. H.M. Stationery Office. Price 3s. 6d.

Recent Research on Hormones

Hormone investigations continue to hold priority of interest in laboratory studies of medical problems. The progress of knowledge in this field has been almost embarrassing. One important advance in hormone chemistry during the year has been the preparation of synthetic oestrogen by Professor E. C. Dodds and his co-workers. This substance has some structural resemblance to the natural female hormone, oestradiol, and is considerably more active, being effective even when taken in small quantities by mouth. Extensive tests of its clinical value have been arranged by the Therapeutic Trials Committee of the Council, of which Professor T. R. Elliott is chairman. This synthesis offers the hope that the properties and actions of some other hormones may eventually be reproduced by substances of a simpler chemical nature and more easily made than the natural products. A series of studies on methods for the preparation and assay of hormones, and particularly of hormones associated with the sexual functions, from human materials such as blood and urine, is proceeding. The preliminary studies have taken place at the Courtauld Institute of Biochemistry, Middlesex Hospital, and at the National Institute. It has now become clear, says the report, that biological assays of "hormone" fractions separable from human urine by methods of partial chemical purification and concentration cannot be made on the assumption that the active materials excreted are the hormones as formed by the gonads, or that a substance showing activity of one kind or the other is of necessity a product of the gonad connected with that function, or even of the gonads at all. In general the investigations have shown that, in default of more exact chemical knowledge and of methods of readier separation and identification, biological assays of partially purified extracts from urine have at best a very limited application in measuring deviations from normal function.

Among many other investigations on hormones one piece of assisted work at the British Postgraduate Medical School may be mentioned—namely, an attempt to confirm and extend Lambillon's finding that the blood pressure in patients with the toxaemias of pregnancy responds abnormally to intravenous injections of the pituitary hormone vasopressin. It has been shown that the extent of the rise in blood pressure produced by the hormone has value in clinical differentiation of types of pregnancy toxaemia.

Vitamins

The elucidation (and multiplication) of vitamins is reported from a score of centres. At the National Institute the antirachitic activities of two substances of the vitamin D type have been tested. These are calciferol (vitamin D_2), produced by ultra-violet irradiation of ergosterol, and vitamin D_3, isolated from the products of the similar irradiation of dehydrocholesterol. The observation has been confirmed that vitamin D_3 is many times as active as calciferol on rickets in chickens.

Last year we made reference to the attempts which were being made at the National Institute to increase the potency of canned peeled apples by adding to them extracts of the peel of the fruit, which contains very much more vitamin C than the remaining portion. These attempts have not been successful. The procedure, instead of enhancing the vitamin C content of the final product, has a deleterious effect, probably due to enzymic oxidation.

At the Dunn Nutritional Laboratory, Cambridge, further studies have been made of a test used for detecting a partial deficiency of vitamin B_1. This depends on the measurement of the amount of the vitamin excreted in the urine under certain specified conditions both before and after the administration of test doses, and it has been possible to establish standard values corresponding

with partial or severe degrees of deficiency. A state of "conditioned deficiency" of vitamin B_1, associated with symptoms of polyneuritis, was encountered in such disorders as gastro-intestinal obstruction, alcoholism, and polyneuritis of pregnancy, while similar deficiencies, although not marked by actual symptoms of polyneuritis, were found to be associated with "reserves" of the vitamin greatly below the normal, the normal being the average value for groups of control subjects.

At St. Bartholomew's Hospital an inquiry has been proceeding into the metabolism of vitamin C in leukaemia; much more of this vitamin is used by the body in leukaemia than in health, but it does not appear, even when given in large doses, to have any favourable influence on the course of the disease. Mention may also be made of Sir Edward Mellanby's work on the experimental production of deafness in young dogs by diets deficient in vitamin A and rich in cereals. In the course of a few months on this diet the cochlear division of the auditory nerve may be completely destroyed. In Scotland a study of family diets is being assisted by the Council. Data have been collected as to the dietary habits of fifty-eight families in the Highlands and twenty-three in the island of Lewis. The records are being analysed in detail for the various food constituents.

The Long Research Front

One gains from the report as a whole an almost cinematographic impression of various work proceeding at many centres, occasionally reaching a positive conclusion, or an almost equally valuable negative one, but more often having to be "continued in our next." It would take up too much space even to name any large number of these researches. Among much other work at the National Institute is a preliminary examination of samples of belladonna root introduced from Bulgaria, which is reported to have favourable effects in the treatment of Parkinson's syndrome. Nothing has been discovered beyond the natural alkaloid of ordinary belladonna root, and the successful results are probably due to hyoscyamine, given in a form which enables the patients to tolerate larger doses. Experiments are being undertaken to determine whether examination of the urine for porphyrin excretion will give warning in advance of the liability of industrial workers to poisoning by substances such as aniline. In the Standards Laboratory at Oxford work on the use of dried agglutinating serum in connexion with the standardization of suspensions is progressing, and with the advent of dried sera, which can be stored for long periods, it will be possible to maintain larger stocks, so that the laboratory will be in a better position to cope with emergencies.

Then there is the various work of the Clinical Research Units, again assisted by the Council. At Guy's observations are being made on the blood circulation in the human limb, and methods have been devised for studying the circulation through the voluntary muscles. At Queen Square the factors which cause vasoconstriction and vasodilatation have been investigated; it has been shown that the main factors are the sensations of warmth and cold, and that alteration of blood temperature plays a secondary part. At the Institute of Anatomy at University College, London, a considerable work on pelvimetry has been carried out in association with the obstetric unit of the adjacent hospital. Pelvic radiographs have been obtained from an unselected series of 500 average healthy young women in the early stages of pregnancy, and the subsequent obstetric history of the subjects is being recorded. The histology of intracranial tumours has engaged the member of the Council staff at the Bernhard Baron Institute of Pathology, London Hospital, and some interesting information regarding the origin of the meningeal group of tumours has been accumulated. At the Royal Free Hospital a grantee has been studying the aetiology and treatment of gastric ulcer in 800 patients, who have been investigated clinically, biochemically, and radiologically. At the Maudsley Hospital a grant has been made for carrying out a large-scale inquiry into the incidence of different types of mental disorder among twins, the data of which are now being analysed, and another piece of work at the same centre concerns the family histories of 100 unselected psychoneurotic patients.

Other work subsidized by the Council includes a study of the incidence of middle-ear deafness in school children under widely different social conditions; the physiology of the stomach and the relation of gastric secretion to blood formation; the physiology of renal secretion; the aetiology and diagnosis of lymphadenoma; methods have been elaborated for registering the onset and quantity of sweating in certain abnormal states of the nervous system; a simplified procedure has been worked out for assessing the incidence of hypovitaminosis C in large groups of school children—the list could be continued almost indefinitely, ranging over all the fields of medicine.

Reports of Societies

MODERN TREATMENT OF FRACTURES OF EXTREMITIES

At the meeting of the Medical Society of London on February 27, with Dr. C. E. LAKIN in the chair, a discussion took place on the principles of modern treatment of fractures of the extremities.

Mr. W. ROWLEY BRISTOW said that fractures were treated throughout the last century as injuries of bones; the soft parts were allowed to look after themselves until such time as the bone injury was healed. In 1895 Lucas-Championnière brought about the first revolution in the treatment of fractures when, discarding to a great extent the treatment of the bone in detail, he focused attention on function and the treatment of the soft parts. In his hands the results were eminently satisfactory, but in the hands of those who followed him they were not so satisfactory for a considerable number of fractures. Certain parts of the regime which he then instituted, however, had remained and filled a useful function at the present time. Then came the era when fractures were treated by open operation in order that they might be reduced and fixed. In the hands of Lane in this country, Lambotte on the Continent, and Sherman in the United States the treatment had good results, but those who followed were not so successful as those who had evolved the process. By the time of the war open operation had been found to yield rather inefficient results, and then there came to the fore the principles of segregation and unity of control under the inspiring leadership of Robert Jones. Jones evolved a scheme for the handling of fractures which, although forgotten in the interval, had been to a great extent recaptured. Böhler in Vienna had given an enormous stimulus to modern treatment by encouragement of function and treatment of soft parts. Mr. Bristow showed the following table as epitomizing the principles of treatment:

Stage	Bone	Soft Parts
I	Reduction	"Wound toilet" if open fracture.
II	Fixation until union	Use the limb as a whole; move all free joints.
III	Protection until consolidation	Use the limb; move all joints actively, massage and faradic stimulation; manipulation under anaesthesia occasionally needed.
IV	Bone repair complete ..	Re-education or rehabilitation; active exercise, curative work, to reproduce occupational stresses.

Reduction must depend upon the surgeon's understanding of the mechanism that caused the fracture. The force which was used and the method adopted depended on the way the fracture was produced. He mentioned some cases, including dislocation of the tarsus and overlapping fracture in the lower third of the tibia or fibula, in which skeletal traction was essential. He knew of no way of reducing such fractures and holding them reduced except by skeletal traction. It had been said that this might be dangerous, but the fact that a powerful force was dangerous if misused seemed a lame argument against its use in indicated cases. Mr. Bristow dealt in detail with the procedure to be followed in fractures in various positions, and showed a cinematograph film from the orthopaedic department of St. Thomas's illustrating the possibilities and advantages of early movement.

Stiffness and Fixation

Mr. T. P. MCMURRAY said that the principles of treatment of fractures were the provision of sound bony union in the shortest possible time with the fewest possible complications. The technique to be adopted was simply the one which the surgeon's mechanical ingenuity found the most accommodating. It must not be supposed that one rule was right and another wrong. Probably the worst complication was stiffness of joints, which occurred from long fixation. A normal joint which was not the site of any arthritis could be held in a normal position for as long as necessary without rigidity. He did not believe that stiffness came from fixation. As a rule—there were exceptions—with intelligent fixation of a normal joint stiffness did not occur. He went on to discuss certain fractures which gave a great deal of trouble. One of these was the rare fracture-dislocation of the neck of the humerus. Three fractures at the elbow-joint which had usually to be operated on, as the fragments could not be got into position by ordinary reduction and fixation, were fractures of the capitellum and external condyle, of the internal epicondyle, and of the olecranon. Another combined fracture which was extremely difficult to reduce was of the shaft of the ulna with dislocation of the head of the radius. With regard to fractures of the lower extremity, it was commonly believed that every fracture of the neck of the femur should have a pin put in it, but he recalled the case of a woman aged 84 who sustained such a fracture and in whom the necessary operation might well have had a fatal result. She got up twenty-four hours after the injury and hobbled about the room, and although now she had a very bad limp, she was alive and fairly comfortable. There was a certain proportion of cases of fractured neck of the femur which should not be touched by any form of surgery, and the fact that there was an ununited fracture was no blot on the surgeon's escutcheon. In a suitable case there was no doubt at all that pinning of the neck of the femur was a splendid operation. If the pinning was successful and bony union achieved there was no other form of treatment to compare with it, but at least 20 per cent. of pinnings of the neck of the femur were quite unsuccessful for one or other cause. In unsuccessful cases he had suggested an osteotomy which transferred the shaft of the femur on to the head. He had carried out this procedure in twelve recent cases, and they had all reunited. It had the disadvantage that the patient was fixed in plaster for three and a half months after the osteotomy.

The first essential in the treatment of fractures was to get reduction, the second to get fixation until union was complete, and it was well to remember that there was no fixed time by which union was complete. A man might break a tibia and a radius, and both reduce perfectly, but the radius might take three months to unite and the tibia six or nine. It was not known why one bone took longer than another, but one should never get into the habit of saying that a bone would take a particular length of time before union was effected.

General Discussion

Mr. J. E. H. ROBERTS mentioned that although Mr. McMurray had said that sound union was always necessary, there was in the Museum of the Royal College of Surgeons the humerus of a sailor with a false joint in the middle. It was recorded that this sailor fell from the rigging of his sailing ship and sustained his fracture, which was untreated, but he continued in his job with that arm for the remaining thirty years of his life. Another exhibit there was David Livingstone's humerus, which showed a false joint following a bite in the arm by a lion. Mr. NOEL ST. J. DUDLEY BUXTON remarked on the bad principle of removing the head of the radius in a child.

Mr. A. CRUICKSHANK asked about fractures of the os calcis, a subject avoided in the textbooks. Most fractures of the os calcis were of the comminuted type. It was doubtful whether prolonged fixation or early movement was the right treatment in a case of that sort. It was a rather common injury among workmen, and operation after operation was sometimes carried out to relieve the pain and disability which followed. Mr. H. E. GRIFFITHS said that Mr. Bristow had omitted to point out that before coming to the principles of treatment on which he had laid such stress it would be well to decide what was to be the aim of the treatment. If the aim was first and foremost to get a man back to his original work at the earliest possible time, then, to start with, Stage I (reduction) might have to go by the board. He thought they should try to decide what range of movement they should get in the particular individual to enable him to do the work to which he was accustomed. He was speaking in particular from experience at the Seamen's Hospital, where the men were often most anxious to get back to their ship or to the docks. Mr. HOPE CARLTON complained that they were handicapped by the "tyranny of the *x* rays." At the back of the mind of the orthopaedic surgeon was the feeling that if he did not follow the indications of the *x*-ray picture he might find himself in the witness-box and be confronted with the *x*-ray evidence and asked why it was disregarded. Too often on this account orthopaedic surgeons endeavoured to get the best anatomical alignment regardless of the function of adjacent joints. Mr. DICKSON WRIGHT described certain experiences in reducing dislocations.

Mr. BRISTOW, replying to the question about the os calcis, said that he personally endeavoured to carry out the treatment as Böhler carried it out, and it was successful in a proportion of cases. Where it was not successful one had to fall back on subastragaloid arthrodesis save in those patients who developed for themselves a rigid subastragaloid joint. Mr. MCMURRAY, also replying on the point, said that many of the cases of fractures of the os calcis which were impossible to treat did as well as those that were treated. He agreed with what Mr. Hope Carlton had said about the tyranny of the *x* rays. Better results were obtained by men who used their fingers and their eyes than by those looking for anatomical end-to-end apposition as shown by *x* rays.

ASSESSMENT OF PHYSICAL FITNESS

A combined meeting of the Sections of Medicine and United Services of the Royal Society of Medicine was held on February 28 for a discussion on the assessment of physical fitness. Dr. H. LETHEBY TIDY, president of the Section of Medicine, was in the chair.

Professor B. A. MCSWINEY opened with the remark that the physical fitness of a country could not be assessed by the number of champions it produced at Olympic games. An estimate could only be obtained by medical examinations covering large sections of the population. This might be afforded by school medical records and by the examination of recruits entering the fighting services, but in the case of the latter the figures might be misleading. For example, it was often quoted that the analysis of 2,500,000 men who were called up between

November, 1917, and October, 1918, showed that only 36 per cent. were fit for military service, but it was overlooked that voluntary enlistment during the three preceding years had already drained the country of its best male population. The methods used to assess the physical fitness of an individual usually included a general clinical examination, anthropometric measurements, and functional tests. Among the functional tests were the reaction of the heart to exercise, measurements of blood pressure and vital capacity, and occasionally measurements of heart size, by the *x*-ray method, and of the basal metabolic rate. The most conclusive tests were dynamic rather than static, and such measurements must take into account age, structural differences, emotional differences, and capacity for long-continued activity as well as exercise of an intensive character. It would be possible to devise methods for laboratory use which would give a good indication of the physical fitness of the individual, but these would be of little value to the medical man who had to make a number of examinations in a limited time. Practical tests must be simple and easily carried out, and, further, tests must be devised to assess the capacity of the individual for different types of exercise. It was doubtful whether any examination for the assessment of physical fitness would give a true indication of mental stamina, by which was meant the ability of the individual to carry out his task under different psychological conditions. It might be asked why the examination used for life assurance should not be employed for physical fitness. The reason was that the examiner for life assurance did not think of fitness in the same way as those who were endeavouring to assess the capability of an individual for strenuous exertion; he was concerned with the likelihood or otherwise of longevity. One of the most important problems of the present day was the assessment of the condition of individuals who were below normal, and the grading of them according to their nutritional state and ability to undertake exercises. The nutritional surveys which were being carried out at present should provide results of interest, but the most valuable information would be obtained from the Army depots where recruits below standard were being conditioned.

Army Recruits

Colonel D. T. RICHARDSON discussed the physical and medical standards of Army recruitment. He began by remarking that there was no exercise which produced such a degree of general fitness and well-being and brought out such powers of endurance as marching, and it was to be regretted that this did not take the same place as formerly in the soldier's programme of training. The first test of all for physical fitness was the objective test—that the recruit looked well; and the subjective test—that he felt, ate, and slept well and performed his daily duties without undue fatigue. Other observations were largely superfluous, although perhaps of academic interest. The average age on recruitment to the Army was 19, and the average weight of the recruit 130 lb. During six months' training at the regimental depot the recruit put on an average of 9 lb. in weight, and no observer could fail to notice the marked change in general appearance, especially in the posture and in the expression. Coming to the soldier as distinct from the recruit, Colonel Richardson said that tests were carried out at the Army School of Physical Training on the increase in bulk and tone of the musculature; the increased power to perform difficult exercises, taking the dynamometer (grip) as a means of measurement; increased endurance (cross-country runs); increased physical and mental agility (using electrical apparatus to determine the reaction period with visual and aural stimuli); the heart tolerance test; and the vital capacity as recorded by the spirometer. The spirometer was considered a more accurate measurement of lung efficiency than the circumferential measurement of the chest. As a test of cardiovascular efficiency the exercise tolerance was of value. Co-ordination was best estimated by putting the subject through a series of balancing tests, allotting marks according to his performance. The condition of the abdominal muscles was the best gauge of the general musculature of the body. He suggested that the 40-mm. test used in the Royal Air Force for respiratory efficiency might be used as the test for the tonicity of the abdominal muscles.

In conclusion he showed a number of photographs bringing out the comparison between the appearance of recruits on enlistment and after six months at the depots at Canterbury and Scarborough, where recruits who were below standard were conditioned. Each of these depots was capable of dealing with 1,000 recruits yearly. The improvement in the physical condition of the recruit was evident from the photographs, but even more striking was the change from a dull and apathetic expression to one of brightness and alertness.

Tests in the Flying Service

Group Captain R. W. RYAN said that muscular fitness was a desirable attribute in candidates for all three services, but in the R.A.F. a stabilized nervous system was also of paramount importance. Theoretically all males between the ages of 18 and 25 should be fit to undertake full flying duties in the R.A.F. if they were acceptable to an insurance company. Owing, however, to the demands of service flying, certain factors required consideration before candidates were passed. Assuming a candidate to be physically sound and possessed of the required visual and auditory capacity, the first of the extra assets which were necessary to ensure that he would carry out his duties in all circumstances was nervous stability. Clinical examination did not detect a potential anxiety state, and therefore the history must be investigated as fully as possible. This included the occurrence in the past of enuresis, insomnia, nervous breakdown at school, sleep-walking, and such conditions. An insight into the candidate's reactions to an occupation demanding nervous control might be obtained from a candid history. The next important asset was capacity for enduring abnormal movement. The machine had not outstripped the individual in straight flight, but any angular deviation might cause the limit of safety to be passed, when one would get the phenomenon of "blacking" with loss of vision with or without loss of consciousness.

The next asset was a reasonable blood pressure. It was the experience in the service that individuals with a low blood pressure reacted badly to abnormal movement, particularly rotation. A healthy ear, nose, and throat condition was necessary. Speed in a straight line did not inconvenience the pilot, but once he deviated from the level he did experience certain stresses, and there was danger of ruptured membranes, which, combined with circulatory disturbances, were likely to cause incapacity in the air. As to other personnel besides the physically fit, cases of concussion lost much service-time through the after-effects, especially when symptoms of the anxiety state developed. Renal conditions such as colic and calculus required a long period of observation before returning to flying duty, and cases of gastric and duodenal ulcer similarly lost service-time. Exposure to excessive noise produced deafness, and pilots developing this condition were a responsibility to the Treasury.

Surgeon Lieutenant-Commander L. J. CORBETT described the service requirements in the Royal Navy, also the conditions ashore and afloat. Officers had stated that in ship companies where regular physical training took place at a definite time, even if it were only for a quarter of an hour a day, a great improvement was noted in the crews, shown by more alertness in gunnery and other duties. The naval man "jumped to it" more quickly when he had physical training. Air Commodore H. E. WHITTINGHAM said that in the R.A.F. two types of fitness had to be considered: one the case of the fighter pilot and the other that of the bomber pilot. The former must have quick co-ordination and be able to stand the stress of centrifugal forces. As regards the bomber, he must be able to stay in the air for long hours and at the same time be exposed

in many instances at altitude to excessive cold and diminished oxygen pressure. The service has tests for the assessment of everything except mental endurance, which was the chief factor with these bombing pilots.

Tests and Age

Dr. J. C. BRAMWELL said that he agreed with Professor McSwiney that the Olympic champion did not represent the type they were considering that evening, but apart from the specialist champions in Olympic games, these contests did produce the all-round man, who could run the 100 yards and also the three miles, could undertake the high jump and the long jump, throw the javelin, and so on; such all-roundness more closely approximated to the type of physical efficiency for which they were looking. Group Captain Ryan had mentioned 18 to 25 as the age period when all men ought to be fit to undertake flying duties, but he wondered whether at 18 the lad had really reached his full physical development. Certainly for events which required prolonged endurance it seemed that a later age was better. He studied the records of the marathon runners in the Olympic games at Amsterdam in 1928, and found that out of the first twelve in the race only one was under 25. He then looked up the ages of the men who accompanied Nansen to the North Pole, and found that their average age was 33. A good many of the people who climbed great heights in the Himalayas were also men of over 25. In the course of some work which he was doing on pulse rates, covering several thousand individuals of different ages, he found that from early childhood to young manhood the pulse rate diminished with age and afterwards suddenly increased. The change from a diminishing to an increasing pulse rate was at the age of 25, so that apparently the cardiovascular system did not reach its full efficiency until about that period.

Dr. E. A. CARMICHAEL thought that the psychological factor ought not to be overlooked. This factor was dependent not only on the natural make-up of the man but in part on what he learned from experience, and he personally would rather be at a post of danger with an experienced man than with a man whose physical fitness was greater but who lacked such experience. He believed that the man with experience would probably come out on top in an emergency, whereas the other might not, and the desired reaction in an emergency was not entirely a question of physical fitness.

General Discussion

Wing Commander A. F. ROOK spoke of the importance, when carrying out tests, of sticking absolutely to the technique. The doctor as a result of his common practice rather tended to be a modifier, but on doing tests such as these he must not let his habit of modifying the findings carry him away. It was also important in testing to know something about the psychology of the man who was doing the test. If it was a man who was "full out," evidently wanting to do the best he could, the result was likely to be very different from that of a man who, perhaps with the same physical capacity, had been invalided from over-seas on account of some flying stress, and had not the same desire to pull off a really good result. One must know something of the feelings of the person who was performing, particularly, the volitional tests.

Dr. HERXHEIMER, medical officer to the German Olympic team, suggested that a distinction should be made between fitness for short exercises and for long exercises. The former called for quick movement of the muscles, such strength as was exhibited in weight-lifting, and the exercise of skill. But all these kinds of exercises did not require any special efficiency of the internal organs. This was only required by the long-time exercises. It was important to assess the physical fitness not only at the moment of examination but as it would be at some future time after training had taken place.

Dr. TIDY, from the chair, stressed the importance of age in all assessment of physical fitness. The figure skater was past his best at 18, the table-tennis player at 22, the sculler and rower at 25, while the rugger player could go on to 28. The golfer, on the other hand, could stagger round the course at an advanced age. The marathon runner—the twenty-five-mile runner—was quite different from anybody else. It was not that as he got on in age his stamina increased; he suddenly appeared as a marathon runner in his late twenties. The three-miler was a small man, practically never over 5 ft. 8 in., and the marathon runner was even smaller. On the subject of age of enlistment for physical training he had felt considerable doubt as to the wisdom of the Germans in taking boys of 16 and giving them all those physical exercises. A boy at 16 was extremely easily tired; one had only to notice how at that age the lad lounged about the house, even though he might be keen on games. The British Army would do better with its recruits at 19 than those who took an earlier age.

BACTERIAEMIA AND ORAL SEPSIS

At a meeting of the Section of Odontology of the Royal Society of Medicine on February 27, Dr. S. D. ELLIOTT read a paper on bacteriaemia and oral sepsis.

The presence of bacteria in the blood stream, he said, had for long provided a convenient working hypothesis in explaining the mechanism by which secondary infective lesions were produced in the body at a distance from a single primary focus; yet it was remarkable in how few instances, comparatively speaking, in these conditions was there direct bacteriological evidence of blood-stream invasion. Experimental work with animals had shown that bacteria were often to be found in the blood without apparently producing any ill effects. Similarly, apparently innocuous bacteriaemias had been observed in man, the determining factor usually being trauma applied to a focus of infection. Turning to dental sepsis, Dr. Elliott said that the mouth provided a focus of infection often exposed to minor degrees of injury which might be expected to lead to bacterial showers in the blood. He had recently concluded an investigation on bacteriaemia following tonsillectomy which had convinced him that blood-stream infection in such cases did often occur. He went on to describe an investigation made by the late C. C. Okell and himself on the result of blood cultures in a series of otherwise normal subjects immediately following dental extractions. In the cases which had had a severe type of oral sepsis and in which a massive extraction was carried out the proportion of post-operative blood cultures from which streptococci were recovered reached a figure as high as 75 per cent., while in another group comprising patients without obvious gum infection but in whom one or two teeth were extracted on account of caries positive cultures were obtained in 34 per cent. The organisms recovered were nearly always streptococci of the non-haemolytic type. The bacteriaemia was apparently quite transient. In twelve cases streptococci were recovered from a specimen of blood before operation; these were all in cases with severe gum infections. The importance of the degree of manipulation of the teeth during extraction in determining to some extent the degree of bacteriaemia following operation was brought home to the investigators, who suggested that mastication or brushing the gums might lead to a similar result. Further work had shown that very slight degrees of trauma in a mouth the subject of marked gum infection were sufficient to produce blood invasion.

Another line of inquiry resulting from this work had been to determine the relative importance of various types of dental infection in their relationship to the invasion of the blood stream. He was at present investigating the incidence of bacteriaemia in acute apical infections. So far only twelve cases had been investigated, but positive blood cultures following manipulation and extraction of the tooth had been obtained in only four out of the twelve, an incidence no greater than that obtained following the removal of one or two carious teeth from a clean mouth. Non-haemolytic streptococci were recovered from the blood on three occasions and *Staphylococcus albus* once. Apparently the acute inflammatory reaction "walled off"

the infected focus from the general circulation in the same way that after massive extractions it closed down the field of absorption.

Remote Effects

Were these transient invasions of the blood stream of any pathological significance? As regards their remote effects he thought it could be said that they produced no ill result unless there was some pre-existing abnormality of an organ or tissue which rendered it more than usually liable to infection. There was some evidence that bacterial infection of the heart valves might follow dental operations, especially where there had been some pre-existing valvular abnormality, as a result of either a congenital defect or rheumatic infection. What appeared to be a significant proportion of patients with subacute infective endocarditis dated the onset of their immediate illness from some dental operation. Dr. Elliott brought to the attention of the Section a few cases in which the history seemed to him to be suggestive. In these cases, following extractions, a subacute bacterial endocarditis occurred after an interval of a few days or weeks, but some of the cases had a definite history of pre-existing cardiac disease (generally of rheumatic origin), and in others the previous history was indefinite.

Could anything be done to prevent these bacteriaemias of dental origin? It seemed clear that, occurring in subjects with pre-existing cardiac abnormalities, such blood infections, although transient, entailed a definite risk of subsequent valvular infection. Scrupulous attention to oral hygiene was specially indicated in subjects with any cardiac abnormality. Massive extractions of teeth should not be countenanced in such patients, and when dental extractions were essential a minimum of manipulation or "rocking" of the tooth with forceps should be employed. From some experiments which Mr. Dudley Buxton and he had carried out they concluded that the preliminary "rocking" of a tooth was immediately responsible for the subsequent post-operative bacteriaemia.

In concluding, Dr. Elliott said that of the two factors—infection and trauma—involved in the production of post-operative bacteriaemia, the former appeared to be the more important, because when it was marked very slight degrees of gum injury were sufficient to produce blood-stream invasion. Complete elimination of the gum infection was difficult to accomplish, although preliminary treatment of the gum margin by some measure such as cauterization might reduce it to some extent and lead to a reduction of the post-operative bacterial shower. Similarly, by reducing the manipulation to which an infected tooth was usually subjected during its extraction the incidence or degree of blood infection might be correspondingly reduced.

TUBERCULOSIS IN THE TROPICS

At a meeting of the Royal Society of Tropical Medicine and Hygiene on February 16, with the president, Colonel S. P. JAMES, in the chair, Dr. CHARLES WILCOCKS read a paper on tuberculosis in the natives of tropical and sub-tropical regions.

Dr. Wilcocks said that interest in the tuberculosis of native races had increased since the war, and the numbers of cases reported in the British Colonies had risen since 1927, according to figures published in the annual medical reports. In India it was estimated that there were 2,000,000 cases of tuberculosis. In Tanganyika Territory he began an investigation at the end of 1930 and travelled over the country examining the general native population clinically and by tuberculin testing, and when possible by *x* rays; for the latter a portable apparatus for which the power was obtained by means of a dynamo operated by the driving wheel of a car was used. In addition a clinic was instituted on the slopes of Kilimanjaro, the highest mountain in Africa. The results of the intradermal tuberculin test, for which the tuberculin was freshly prepared each day, showed that in the areas of greatest concentration of population the rates of positive reactors were not unlike those found in London, and among adults there were over 80 per cent. of positive reactors. In the areas of scattered population the adult rate was about 50 per cent. Women were slightly less affected than men, and the rates in children varied with age in the usual way. Strongly positive reactions and vesiculation were more frequent in densely than in sparsely populated areas. Tests were performed and read on 10,121 persons of the general population.

Method of Spread

The numbers and proportions of cases of actual tuberculous disease—for which the criterion of diagnosis was unequivocal *x*-ray evidence of infiltration, or positive sputum with physical signs, or the classical signs of non-pulmonary lesions—were similarly higher in the densely populated than in the sparsely populated areas, and in the examination of 9,866 natives of the general population, as unselected as possible, a rate of incidence of the disease of 11.55 per 1,000 was found. In England and Wales the patients on the dispensary registers represented about 4.6 per 1,000 of the population in 1937. The highest percentages of positive tuberculin reactors, the highest proportion of cases of definite tuberculous disease, and a very high incidence of intense reactions to tuberculin were found in the family contacts of patients suffering from tuberculosis. From these findings it was deduced that contact was the principal factor in the spread of tuberculosis, and that this was closest in families and more effective in densely populated than in sparsely populated districts. The common diseases of natives and the differences in diet did not appear to exert much epidemiological effect, though in individual cases they might do so. The natives appeared to be able to resist the infection, but were not so capable of dealing with established disease, under the circumstances in which they live, as were the white races. The formation of protective fibrous tissue was not common but did occur, and this might be accounted for by lack of knowledge of how to treat the disease. Recent work had shown, however, that these native patients derived considerable benefit from collapse therapy. The bovine type of *Myco. tuberculosis* was not common in East Africa, though it had been found.

It was concluded that modern treatment should be available in the general hospitals, and every means should be used to raise the standard of living and education of the natives.

Conditions in China

Dr. H. H. SCOTT said the tables shown by Dr. Wilcocks indicated an enormous increase in the prevalence of tuberculosis during the last ten years. Thus, in Nigeria the increase was fivefold, in Tanganyika more than threefold, and in British Guiana sixfold. While agreeing that there was an absolute increase, he did not think it as great as the figures suggested, since more intensive study revealed hidden cases, and the diagnosis had often been based on that short-cut method, the tuberculin test. Statistics of the result of this test in, for example, London, Paris, and Vienna had revealed that approximately 20 per cent. of children under 2 years, 50 per cent. of those under 5, 90 per cent. of those under 15, and 97 per cent. of adults gave a positive reaction. In some of the Colonial reports such results had been returned as indicating tuberculosis. In short, infection had been regarded as synonymous with the disease, which was a sad mistake, for in places where the incidence of positive reactions was high the mortality and morbidity were low, and vice versa. Dr. Wilcocks's findings were based not on the tuberculin reaction but on *x*-ray studies and sputum tests; in other words, on cases of the disease and not merely of infection. It had been estimated that a person with open pulmonary tuberculosis might expectorate 4,000,000 bacilli daily. In China the poorer people lived in dark cubicles where the sun might never penetrate, the floors were indescribably soiled with sputum, and children crawling about on it absorbed enormous doses.

In all native races infection took place mostly by the mouth and the respiratory passages. Intestinal tuberculosis was more rare than pulmonary, and often was secondary to it; glandular involvement and terminal distribution by the blood stream were not uncommon. Broadly speaking, tuberculosis among native races might be divided into (1) "natural" tuberculosis, characteristic of those not immunized in any way; and (2) "modified" tuberculosis, a more chronic condition, so called because it was modified by primary infection. His analyses of necropsies in China showed tuberculoma of the brain to be common in children under 10 years, as was also tuberculous adenitis. Miliary tuberculosis, on the other hand, was more common in adults. Fatal haemoptysis had never occurred in children in his series, though it was by no means rare in adults. Tuberculosis was a disease of civilization. No race was immune, and when it was introduced from without, as in Hawaii, the Cameroons, and the Bahr-el-Ghazal, a heavy toll of fatalities resulted.

General Discussion

Dr. VINCENT HODSON said that in this country there were three main divisions of tuberculosis: (1) an infantile fulminating type with ulceration, glandular involvement, and general dissemination; (2) an intermediary type in children of from 5 to 15 years, in which there was involvement of glands, bones, joints, and serous membranes, the mortality from which was slight; and (3) an adult type, in which the lungs, kidneys, genitalia, and skin were prone to be implicated. Every case of new infection, whatever its nature, involved the corresponding glands. Dr. Wilcocks's cases in African natives belonged to the infantile type. In all the radiographs shown by Dr. Wilcocks there was evidence of glandular enlargement, indicating a new and fresh infection. As Dr. Scott pointed out, pulmonary tuberculosis in the adult caused no enlargement in the thoracic glands. Dr. J. W. LINDSAY said that all the civilized tropical countries of South America had to-day the twin diseases—leprosy and tuberculosis. But whereas formerly leprosy had been the more urgent problem, tuberculosis was now outstripping it in importance. Leprosy was perhaps the slowest of all chronic diseases; tuberculosis was much more rapid, and the mortality was two hundred times higher than that from leprosy.

Dr. C. C. B. GILMOUR dealt with the incidence of disease in cattle in Malaya, and with certain practical difficulties in the management of tuberculous native patients. He pointed out that in Singapore and many other parts of the Tropics it was quite impossible to isolate the native patient at home. Hospital and sanatorium facilities did not exist, and, if they did, what was to happen to the wife and family and what was to happen to his job once the patient left home? Mr. J. E. H. ROBERTS pointed out that the disease being treated in England by surgical measures was not the disease he saw in the exhibit of *x*-ray films from African natives. Dr. C. E. BEVAN described an interesting state of affairs in Cyprus, where, though the tuberculin reaction was rarely positive, tuberculosis was essentially mild in type. The Cypriot was not virgin soil as was the African native: presumably he had been exposed to tuberculosis for centuries, and as a result had inherited a high degree of immunity. Propaganda, in his opinion, did more harm than good. He felt that more attention should be paid to industry, and where necessary legislation should be introduced to ensure that natives employed in industry could work and live under hygienic conditions.

PRE- AND POST-OPERATIVE TREATMENT

A discussion on pre-operative and post-operative treatment took place at a dinner-meeting of the West London Medico-Chirurgical Society on March 3, Dr. MAURICE SHAW presiding.

Mr. CECIL JOLL said that so far as concerned the diet preliminary to operation he was a great believer in allowing the patient to have what he wanted. Apart from operations on the stomach and possibly the colon, he did not think there was enough information to justify any serious restriction of the patient's diet. He did not approve of pre-operative starvation. With regard to septic foci, here again he was antagonistic to the idea of any considerable removal of septic teeth, and, indeed, few patients with serious surgical lesions could afford to wait the necessary time. One of the things he had found most valuable in preparing patients for operation was to get them accustomed to an oxygen tent. Nothing was more alarming for most patients than to wake up after operation and find themselves confined in a tent; it induced claustrophobia in some of them. His practice with regard to blood transfusion was to give a pint or a little under a pint two days before operation. A diminution in post-operative haemorrhagic complications had taken place since that method was adopted, but he thought that sometimes donors' blood was wasted by being given pre-operatively in cases where it was not strictly necessary. Often people who had only moderate degrees of anaemia, which could be readily controlled by ordinary remedies, were given blood transfusion. Some were in favour of prophylactic vaccine therapy in dealing with certain abdominal lesions, and this was strongly recommended in diseases of the colon. He himself was a sceptic with regard to vaccine therapy as a prophylactic measure in the surgery of the large bowel. Such surgery depended upon proper surgical technique, and no method of vaccination could protect the patient from the results of indifferent surgery. He was not sure of the advantages of the colonic wash-out. Many patients were better with a simple glycerin enema than with a large soap-and-water enema, which led to a considerable amount of gas formation subsequently. This subject of pre- and post-operative treatment could not be considered apart from the anaesthetist, upon whose skill and knowledge the avoidance of post-operative complications to no small extent depended. Gentle handling by the surgeon and care with regard to the posture of the patient on the table were of great importance in the same connexion.

Post-operative Shock

Mr. Joll went on to discuss the prevention and treatment of post-operative shock and the importance of providing fluid. He described the great advantage of the method introduced by Murphy of the rectal drip, which he said could be carried on for days; he had succeeded in getting several litres of fluid absorbed before it was necessary to remove the tube on account of a little rectal irritation. On the subject of post-operative pain, he said that many people believed this could be eliminated by some form of prophylactic injection of eserine or one of the hormones (and the list of them was now formidable), but in his experience they were extremely disappointing. It would be well to have a little more faith in the patient's recuperative powers; people were easily panicked into overdoing post-operative treatment. The use of various enemata was again disappointing. Very often the use of the simple glycerin enema followed by the rectal tube would do quite as much as any of the more drastic colonic injections. In a bad case of post-operative pain he had found advantage in using a spinal anaesthetic, particularly if the operation itself was not done under spinal anaesthesia. On the subject of feeding after operation, Mr. Joll dissented from the practice of feeding on slops for days. He thought that many patients could be put on solid food within twenty-four hours. He also thought it advisable to give the patient reasonable quantities of fluid. He did not believe in sips of water, which only irritated the patient; one or two ounces of water relieved the thirst, and, except when vomiting was prominent, he had never seen it do any harm. Some people were in favour of early mobilization of a patient, but so many of these patients were really ill when operated on that to get them out of bed within two or three days seemed a very drastic procedure. Moreover, patients were apt to resent the idea of their illness being treated so

cavalierly. Mr. Joll went on to make a few further remarks on this subject from the special point of view of operations on the thyroid.

General Discussion

Mr. A. SIMPSON-SMITH mentioned that the Mayo Clinic claimed 50,000 abdominal operations without thrombosis or embolism, and attributed this to giving 1 grain of thyroid morning and night and getting the patient to undertake deep-breathing exercises. Dr. E. H. HUDSON referred to the fact that many hospital patients had had for years a vitamin-deficient diet, and some readjustment in respect of nutrition was necessary if operation was to be undertaken with the best chances of success. Another important point was that the patient should have had no respiratory illness immediately before coming up for operation. Even a mild cold should delay the operation for two or three weeks. Some effort might also be made in obese patients to get down the weight. Most people, including surgeons, thought it an ideal arrangement to have the patient hospitalized for four or five days before operation in order to accustom him to the use of bed-pans and the other nursing arrangements, but this was not always satisfactory. It might considerably reduce the incidence of post-operative chest complications if a physical training class were started for all patients on the waiting list, especially if they were aged 35 or over. Oral sepsis was a great difficulty. In many cases of lung complications a gross degree of oral sepsis was found, and though sometimes it was difficult enough to get them to have the operation in the first place, let alone having the teeth taken out first, he thought some effort should be made to clean up the mouth, especially in patients rather liable to bronchitis and in the obese type of patient.

Mr. W. MCADAM ECCLES referred to the saying that every surgeon should himself undergo at least one major operation. He had undergone two large abdominal operations, and his personal experience might be of some interest. It was important to have at least two nights in hospital before operation—the first night to enable the patient to get accustomed to a strange bed, the intervening day to be taken up with the necessary preparations—and on the second night a really good sedative should be given, the operation being done, if possible, early the next morning. The psychology of the patient deserved some study. Even minor discomforts at such a time took on a great importance, and it was worth a great deal of trouble to avoid them. Dr. GEOFFREY KONSTAM referred to the abuse of fluid both before and after operation. Some patients were lost by being "drowned in an excess of fluid." They were rather too inclined to look upon the human organism as a sort of lavatory system in which it was necessary periodically to pull the chain. The term "flushing out" was used far too casually. In genito-urinary operations the prostatic patient was often debilitated from a cardiac point of view, but he was nearly always submitted to the flushing-out procedure, and not infrequently congestive failure developed. The use of rectal saline was known to be life-saving in certain cases, but even that was given unnecessarily. Where there was any doubt about the efficiency of the kidneys a simple water excretion test should be carried out before operation.

Mr. A. E. ROCHE said that one pre-operative measure was to avoid operating on the wrong patient. He had known cases where that had very nearly happened. Mr. NEIL SINCLAIR said that in a case of post-operative hiccup it was not a bad thing to ask the patient what he himself would like. One patient who had suffered from hiccup for forty-eight hours was asked this question and said that he would like a small bottle of dry ginger ale. It was obtained for him, and the hiccup stopped at once. Mr. H. L. ATTWATER stressed the need for the avoidance of routine, especially with the old prostatic patient. Mr. JOLL doubted whether there was very much in the idea, which Mr. Simpson-Smith had quoted from the Mayo Clinic, of daily thyroid as a means of avoiding embolism. He had tried it, and pulmonary embolism still made its appearance.

PLACENTA PRAEVIA

A meeting of the Section of Obstetrics of the Royal Academy of Medicine in Ireland was held on January 27, with the president, Dr. J. S. QUIN, in the chair. The Master of the Rotunda Hospital, Dr. A. H. DAVIDSON, read a paper on the treatment of placenta praevia.

Dr. Davidson gave a statistical review of the results achieved by the Dublin maternity hospitals during the past five years in cases of placenta praevia. There were 304 cases, with nineteen maternal deaths, five of which were due to haemorrhage and six to sepsis. The number of anaerobic and *B. coli* infections was high, suggesting that great care should be taken before intravaginal manipulations. Embolus, bronchopneumonia, cardiac disease, and the anaesthetic accounted for the rest of the maternal deaths. There were 161 foetal deaths. The treatment adopted in 179 cases was compression with the half-breech; 105 deaths occurred in this series—that is, there was a foetal mortality of 74 per cent. Willett's forceps was used in thirty-eight cases with twelve deaths (31 per cent.). Caesarean section was undertaken in twenty-four cases with one foetal death. Puncture of the membranes was done in thirty-six cases with six foetal deaths. The vagina was plugged in eleven cases with five foetal deaths. Nineteen infants were born spontaneously with two foetal deaths. Of the infants lost 100 had reached a stage of maturity which entitled them to methods of treatment aimed at reducing the foetal mortality. The incidence of foetal abnormality was above the average, suggesting that *x*-ray examinations might be made before resorting to Caesarean section.

Vaginal examinations should not be attempted before admission to hospital, and the more frequent use of blood transfusion was advocated before the actual treatment started. Post-partum haemorrhage had to be guarded against. Version and the bringing down of a leg was invaluable in urgent cases, but should not be applied when the mother was in good condition and the infant was more than thirty-four weeks. In such cases puncture of the membranes was recommended for lateral, Willett's forceps for marginal, and Caesarean section for central or partial, placenta praevia.

General Discussion

Dr. J. S. QUIN, the president, said that this was the first time that a presentation had been made to the Section of the joint results from the three Dublin maternity hospitals. The figures brought before them ought to shake the complacency of the Dublin school—which was supposed to be the very home of midwifery. One-third of the deaths were due to bleeding after the condition had been diagnosed; he felt that these deaths were in most circumstances avoidable. He mentioned the installation of a blood storage bank at the Meath Hospital, and said that it was now always possible to obtain blood for transfusions from it without having a donor. Dr. J. F. CUNNINGHAM, Master of the National Maternity Hospital, said that the importance of not interfering with these patients before they were admitted to hospital could not be too strongly stressed. In any "clean" case with a central placenta praevia Caesarean section should be undertaken. Vaginal plugging, he thought, should be abandoned. He also condemned the giving of pituitrin in cases of placenta praevia. He did not like using pituitrin at all in haemorrhage of any kind, and thought there was such a thing as "pituitary shock," which should certainly be avoided.

Dr. R. M. CORBET said that he had personally delivered no fewer than sixty-six cases of placenta praevia; there were three deaths, a maternal mortality of 4.5 per cent.—which he did not regard as at all satisfactory. With regard to the results in the Coombe Hospital during his Mastership, four patients had died: one from sepsis; one from pulmonary embolus after version had been done and the patient was quietly progressing in labour; one seemed to be an anaesthetic death under ether; and one patient had been admitted bleeding freely and with

severe bronchopneumonia, from which latter complaint she died. The patient who died from sepsis was transfused; there was no particular blood loss in the other three cases and they were not transfused. He agreed that transfusion was very important and could be a life-saving measure. He had only performed eight Caesarean sections for placenta praevia—six classical and two lower segment operations; where the placenta was situated on the posterior uterine wall the lower segment operation had merits. He had done Caesarean section on a patient who had been twice plugged before admission to hospital.

Dr. BETHEL SOLOMONS suggested that when Caesarean section was done the classical procedure was the operation of choice. He made a plea for the extended use of submammary saline solution before attempting any manipulation. Saline was always available and blood was not. In his own series of 138 cases in hospital during his Mastership, with two deaths, none of the patients received blood transfusions, but nearly all had premedication with submammary saline solution. If blood was available, however, it should be given, and blood transfusion was essential in the treatment of puerperal sepsis following placenta praevia.

Local News

SCOTLAND

Professor Henderson on the Criminal Justice Bill

At the annual meeting on February 27 of the Royal Edinburgh Hospital for Mental and Nervous Disorders Professor D. K. Henderson, physician-superintendent of the institution, commented in his report upon certain proposals contained in the Criminal Justice Bill. He asked whether the dividing line between conduct on the level of mental unsoundness and anti-social acts of an aggressive or delinquent nature was so wide as to warrant entirely different forms of approach and treatment. Readjustment, he said, might be more likely to occur even in the latter cases by an elucidation of all the contributory causative factors than by an arbitrary prison sentence. There were individuals who failed to fit into society and who exhibited anti-social conduct of a recurrent or episodic nature, which frequently could not be separated from the difficulties of personal development that had been present from an early age. These might be called malignant personalities, and the public for the most part believed that such persons were not exhibiting uncontrollable conduct at all but simply conduct which was not controlled, so that society was well rid of them. Opponents of these views were accused of mawkish sentimentality, of overstraining the truth in an effort to defeat the ends of justice. Psychiatrists were, however, fully aware of their obligation to society, and recognized that while attempting to cure the patient they must also protect the lieges. Up to the present no special provision had been contemplated other than prison on the one hand and mental hospital treatment on the other, and this hard-and-fast differentiation had limited the scope both of the lawyer and of the doctor. Psychiatrists did not consider that a partially responsible person should necessarily be liberated at the end of his sentence, but rather that he should be detained and safeguarded until it could be proved that a sense of real responsibility had been developed. Clause 19 of the proposed Bill dealt directly with this problem, and suggested that a court should have power to include in the probation order a provision requiring the probationer to submit for a period up to twelve months to mental treatment. The speaker believed that this would ensure the proper care of many socially aggressive and inadequate people for whom neither prison nor mental hospital was suitable, and yet who required skilled treatment. Professor Henderson made an urgent appeal for Jordanburn Nerve Hospital, which carried on preventive and educative work unique in Scotland. The managers recognized that treatment of mental cases did not consist merely in curing and caring for those who required admission; an even more important function was to prevent serious mental breakdown. Jordanburn Nerve Hospital had been established for this purpose, and provided accommodation for fifty in-patients. The number of new out-patients treated was 338, while continued treatment had been provided for 1,682 in the out-patient department.

Glasgow Royal Infirmary

At the annual meeting of Glasgow Royal Infirmary, held on February 13, Mr. John Colville, Secretary of State for Scotland, referred to the necessity for co-operation between voluntary and rate-aided hospitals. The whole question put forward last summer of finance between voluntary and rate-aided hospitals was now being closely examined, and he hoped that the conference on the subject would have valuable results. It was stated at the meeting that the total subscriptions from workers last year were £34,584, an increase of £4,403. Sir James Macfarlane stated that Canniesburn Auxiliary Hospital for paying patients was now being utilized practically to its full capacity, with the result that the number of patients treated in the wards of the Royal Infirmary during 1938 was 17,926, or almost 1,000 less than in the previous year. Still more cases could have been admitted to Canniesburn, he said, if accommodation had been available.

New Maternity Block at Edinburgh

The new maternity block of Edinburgh Royal Infirmary was opened for the admission of patients on March 1, when the patients in the Royal Maternity and Simpson Memorial Hospital were transferred there. It occupies the site, extending to about two and a half acres, upon which George Watson's College for Boys previously stood. It is built round a rectangular court and rises to five floors on three sides and to two floors on the north. All the wards face south, and are provided with balconies extending the full length of the frontage and of sufficient width to accommodate beds when desired. The hospital wards contain 122 beds, but the cubic space is such that a considerable increase in the number of patients is possible without further extension. There is provision for ante-natal accommodation on the ground floor, and twenty beds are available on the fourth floor for cases suspected of being infected. Two double theatres are provided for normal confinements, and there is also a large operating theatre and a capacious lecture room. A special feature is the accommodation for postgraduate courses, and a suite of living-rooms for six graduates has been provided in one of the wings. The instruction will include attendance at lectures and demonstrations, at normal and emergency deliveries, and at the ante-natal and post-natal clinics. During the last three weeks in July a special intensive postgraduate course in midwifery and gynaecology will be held, for which the fee, inclusive of board and lodging, is £25, or if the graduate does not reside in hospital, £10 10s. Communications concerning this course should be addressed to the Registrar, Maternity Pavilion, Royal Infirmary, Edinburgh.

The new Florence Nightingale Nurses' Home is situated to the north of the maternity block, and consists of a main central block, seven floors in height with two wings projecting to the south and one to the north. The ground floor is used for common rooms, the middle five floors contain 280 bedrooms, and the top floor is a nurses' sick ward and rooms, providing some thirty-six beds. The accommodation is so arranged that nurses undergoing maternity training are separated from the nurses in general training.

ENGLAND AND WALES

Consultant Advisers on the Organization of Hospitals in War-time

On the nomination of the Presidents of the Royal Colleges of Physicians and Surgeons the Minister of Health has appointed the following to advise him as to the policy to be adopted in England and Wales on various matters arising within the specialties indicated: Dr. Gordon M. Holmes, M.D., F.R.C.P., F.R.S. (*Neurology*); Dr. Bernard Hart, F.R.C.P. (*Psychiatry*); Mr. Gwynne Williams, M.S., F.R.C.S. (*Orthopaedic Surgery*); Sir Cuthbert Wallace, Bt., F.R.C.S. (*General Surgery*); Sir Harold Gillies, F.R.C.S. (*Facial and Jaw Injuries*); Mr. A. Tudor Edwards, M.Ch., F.R.C.S. (*Chest Wounds*); Professor Hugh Cairns, D.M., F.R.C.S. (*Head Injuries*); Professor F. R. Fraser, M.D., F.R.C.P. (*General Medicine*); Mr. W. M. Mollison, M.Ch., F.R.C.S. (*Ear, Nose, and Throat*); Mr. C. B. Goulden, M.Ch., F.R.C.S. (*Ophthalmology*); Dr. A. E. Barclay, M.R.C.P. (*Radiology*).

Royal Visit to Birmingham Hospital Centre

The Birmingham Hospital Centre at Edgbaston was visited by the King and Queen on March 1, when the Queen renamed the hospital after herself, "The Queen Elizabeth." It was intended that Their Majesties should open the Hospital Centre in July last, but this was prevented by the illness of the King, whose place was taken by the Duke of Gloucester. In paying their visit eight months later they had the advantage of seeing the hospital in more complete working order. Accompanied by the Earl of Dudley and Lord Austin, they made an extended tour of the well-appointed airy wards and balconies, talked with many of the patients, and examined modern aids to diagnosis and treatment. They also visited the new nurses' home, in the main hall of which the renaming ceremony took place, and then made their way to the other side of the buildings where the medical school has been erected. Here they were shown various interesting laboratory experiments, including the amplification and broadcasting of the sound of heart-beats and the demonstration and measurement of industrial fatigue. In the museum of the school building they paused before the memorial of Mr. Joseph Chamberlain, first Chancellor (1900–14) of Birmingham University, whose son, the Prime Minister, was in attendance. A description of the hospital centre and the medical school appeared in these columns on July 16, 1938 (p. 138), on the occasion of the opening. During a crowded day in the Midlands capital the King visited the "heavy" section of the British Industries Fair at Castle Bromwich, where his attention was drawn to a splinter- and gas-proof air raid shelter, sunk twenty feet beneath alternate layers of earth and concrete, which, it was said, would withstand a direct hit. The Queen visited the latest Birmingham municipal housing enterprise for the accommodation of families displaced by slum clearance, and before leaving Birmingham the King and Queen both witnessed a physical fitness display by women and girls.

Joint Tuberculosis Council

The Joint Tuberculosis Council held a quarterly meeting on February 18 in London at the house of the Society of Medical Officers of Health. Dr. G. Lissant Cox (in the absence from the country of Dr. S. Vere Pearson) presided. Tribute was paid to the late Dr. F. W. Goodbody and Sir Robert Philip. Congratulations were conveyed to Sir Wilson Jameson on his knighthood. Discussion took place on the draft memorandum presented by the committee (with Dr. James Watt as convener) appointed to consider the organization of the tuberculosis service in time of war. The report was amended in several respects and the final copies will be published shortly. Briefly the report envisages the necessity for the tuberculosis service to continue its work during war-time and to be ready to deal with a probable rise in tuberculosis morbidity; the examination of patients referred from recruiting authorities; men discharged from the Forces with tuberculosis; and the movement of population by evacuation schemes. With the probable departure of the younger tuberculosis officers for medical service the simplification of records and of all non-essential work should be planned now. The economical use of tuberculosis institutional accommodation is outlined; and the immediate action to be taken on the declaration of a national emergency is enumerated. Dr. F. R. G. Heaf reported that arrangements were being made for a series of postgraduate courses as follows: (1) in London (May) for tuberculosis officers, (2) at Heatherwood (May), (3) in Lancashire (June), (4) an intensive course in London for general practitioners (date to be fixed later), (5) a course at Cheshire Joint Sanatorium to be arranged to suit Dr. Edwards, (6) a course in radiology with Dr. Paton Philip at Cambridge. A report on "Skiagraphic Terminology" in pulmonary disease was presented by Dr. G. Jessel, the convener of a committee of five with four co-opted radiologists. The report draws attention to the lack of uniformity at the present time in reporting on skiagrams, and a number of recommendations are made to improve the position, including the use of certain phrases for particular meanings. Here again it was decided to have the report printed and circulated to constituent societies and to the medical press. Among other matters considered by the Council were major surgical treatment of pulmonary tuberculosis, its indications and scope; and the institutional treatment of children suffering from pulmonary tuberculosis. Committees were appointed to report to the Council on these subjects, the conveners being respectively Mr. J. E. H. Roberts and Dr. Peter Edwards.

Correspondence

Acute Dilatation of the Stomach

SIR,—Mr. Hamilton Bailey's article on acute dilatation of the stomach (*Journal*, March 4, p. 434) deals with the diagnosis and treatment in a practical and attractive manner. He has not given us the benefit of his views on prognosis as affected by modern methods of treatment.

My own limited experience of acute dilatation of the stomach indicates that recovery is the rule. Some of the older editions of modern textbooks state that "recovery has been known," and other records mention a death rate of from 60 to over 70 per cent. Little has been added to our knowledge of acute dilatation in the last twenty-five years, but treatment has undergone a radical change. Postural treatment (1895) probably was the first important advance. Mr. William Doolin of Dublin, writing in 1918 (*Brit. J. Surg.*, **6**, 125), mentions a series of thirty cases in which this method was employed with a mortality of less than 7 per cent. Mr. Bailey points out that postural treatment now is relatively unimportant, but failing immediate response to other forms of treatment it should be adopted. The next real advance in the treatment of these and similar cases was the universal adoption of the indwelling Jutte or Ryle tube for continuous aspiration and lavage. This plan, combined with the intravenous replacement of fluid by the drip method, has, I think, completely changed the outlook. I have not seen any recent statistics. Mr. Bailey points out that the condition can be diagnosed before the patient vomits.

It is not generally realized that dilatation may occur during the course of a laparotomy and be recognized within a few moments of its onset. In such an event rational treatment is followed by uniform success. Some

years ago, while operating upon a young adult for duodenal ulcer, and while I was palpating the duodenum, what appeared to be a normal stomach commenced to dilate. The process resembled the gradual inflation of a child's balloon. In a short space of time the size of the stomach reached such dimensions that a contemplated gastro-enterostomy could not be attempted until deflation was secured by a stab wound in the anterior wall. The post-operative course was uneventful. Mr. Doolin mentioned this case and a somewhat similar case he had witnessed. All reports appear to show that immediate deflation and aspiration of fluids is successful, and that delay, as in cases of true intestinal obstruction, may prove fatal.

Mr. Bailey mentions that possibly the greatest incidence follows prostatectomy. I have suspected the onset of acute dilatation in some early anxious cases, but the diagnosis is never certain unless we can exclude the approach of uraemia. In both conditions the general signs and symptoms are very similar. Doubt is increased by the fact that in both the urine is diminished in quantity or completely suppressed.

I have always passed the Jutte or Ryle tube via the nose, as illustrated in the article. The nasal has many advantages over the oral route. Finally there is just one elementary point in connexion with the passage of the tube which is perhaps worthy of more attention. If the patient is asked to continue drinking slowly and without interruption from a feeding-cup the tube is carried peacefully to its destination in a stream of tranquil water. On the other hand, if the patient is in distress and the tube in the hands of a novice, sips of water swallowed at the word of command may be mistimed. The tube then becomes engulfed in a whirlpool of sips and secretions, and navigation becomes impossible. A few moments of normal imbibition instead of intermittent gulping sometimes make all the difference between a rough and a smooth crossing from nasopharynx to oesophagus, and the patient is saved the misery of *mal de mer*.—I am, etc.,

London, N.W.1, March 6. WILLIAM I. DE C. WHEELER.

Explosion of Anaesthetic Vapours

SIR,—We have been asked to join a committee appointed by the Institution of Electrical Engineers to consider the question of electrical safety in relation to the equipment of operating theatres and adjacent rooms where there may be danger of explosion of anaesthetic vapours. The committee includes Mr. H. W. Swann, nominated by the Home Office, and Dr. E. H. Rayner of the National Physical Laboratory. It is known that twenty-three explosions of this kind have occurred, of which fourteen were attended by fatal results, but it is probable that the number of explosions is much larger than this, since there is no obligation to report them to any central authority.

The work of the committee would be much helped if any anaesthetist or surgeon in possession of first-hand knowledge of any explosion of this nature would supply us with a detailed account of the case. The chairman of the committee is Mr. H. T. Young, past-president of the Institution of Electrical Engineers, and he would be most grateful for any information, which would be regarded as strictly confidential.

Communications could most conveniently be sent to Dr. C. F. Hadfield, 47, Queen Anne Street, London, W.1.—We are, etc.,

LIONEL COLLEDGE.
London, W.1, March 4. CHARLES F. HADFIELD.

Poliomyelitis after Tonsillectomy

SIR,—I have read with interest the article by Drs. D. M. Anderson and J. H. Dixon in the *Journal* of November 26, 1938 (p. 1077). These authors describe two cases of fatal bulbar poliomyelitis which occurred twelve days after tonsillectomy. Almost at the same time I published similar observations in conjunction with Dr. Maxwell Stillerman (*Amer. J. Dis. Child.*, November, 1937, **54**, 984; ibid., October, 1938, **56**, 778). In this last article we attach great significance to the occurrence of cases of bulbar poliomyelitis which occur following tonsillectomy and adenoidectomy, and believe that the pathway for the entry of the virus is through the open tonsil and adenoid bed, as described by Drs. Anderson and Dixon. Their observations, and others which we quote, led us to the important conclusion that operations in the nose and throat area should not be performed during epidemics of acute poliomyelitis.—I am, etc.,

New York City. ALFRED E. FISCHER.

The Use of Gas-protective Clothing

SIR,—In a series of experiments carried out in conjunction with Dr. Argyll Campbell in 1924, at the National Institute of Medical Research, London, we found our subject, who had a good deal of preliminary training, to be not sensibly relieved by wetting the outer surface of his gas-protection clothing in a room at a temperature of 75° F. He was working a bicycle ergometer at a rate equivalent to marching with a light load, and wore a light wool singlet, short cotton underpants, light flannel trousers, cotton shirt, and light cotton socks.

Surgeon Commander E. R. Sorley's subjects (*Journal*, February 25, p. 385) wore only singlets, shorts, and socks, and they were relieved by the wetting of the outer surface of the suit. We think the difference in the amount of underclothing may be the explanation of the differing result, and that this is a point which is of importance and requires further trial. When our subject wore nothing but a loincloth he felt miserably clammy under the gas-protection dress. The best index of discomfort, which if unrelieved may go on to heat-stroke, is the rate of the pulse. We did not let our subject's pulse go beyond 140. It reached this figure after thirty-two minutes' work. It takes time to heat up the body, and work can be carried out safely till the pulse rises above this figure. In some of Surgeon Commander Sorley's subjects, in Singapore, the pulse rate rose to 150, this after shovelling sand for ten to twenty-five minutes, with an outside temperature of 86° to 87° F.—I am, etc.,

St. John Clinic, London, S.W.1, March 1. LEONARD HILL.

Health and the State

SIR,—The Minister of Health gave us in the *Journal* of February 25 (p. 371) a very careful review of the development of the health services of this country. There must be many people like myself, however, who were disappointed to find that in so responsible a survey the whole work in mental and psychological medicine, which has been developing so much this century, is summed up in the statement that people are "no longer contenting themselves with chaining up lunatics."

We shall look forward to a further communication in which the *mental* health of the State is brought under review, for there is positive progress to record. The increasing co-operation between general, psychiatric, and preventive medicine is a matter of importance.—I am, etc.,

London, W.1, Feb. 28. J. R. REES.

Incidence of Psychoneurotic Illness

SIR,—Dr. Charles Shearer's letter (March 4, p. 473) on the "question of the quantitative measure of psychoneurosis in this country" would have been more valuable had it been more exact. Unfortunately he has not defined the terms he has used.

Mental conflict is generally regarded as the cause of psychoneurosis. Such conflict might, in rare instances, arise from a family bereavement. The fear of the unknown is a common symptom, but not a cause, of psychoneurosis. Yet these and a third—"loss of face"—are cited by Dr. Shearer as ordinarily found as causes of psychoneurotic illness. Moreover, he discovered "flagrant mental trauma" in every one of his 120 cases. What does he mean by mental trauma? As the result of analysis mental traumata are often made conscious. But these could never be described as "flagrant"—a word which should be used only of conscious processes.

It would seem probable that Dr. Shearer is using the term "psychoneurotic illness" in a popular and unorthodox sense. The type of psychotherapy used is not specified. This is regrettable, for the results are staggering: with the exception of a few elderly persons all his patients "recovered" after four or five attendances! The classification of "medical sickness" adopted suggests that Dr. Shearer may have overlooked many examples of psychoneurotic disability appearing under the guise of one or other of the so-called "organic" conditions he mentions.—I am, etc.,

London, W.1, March 6. E. A. BENNET.

Shock Therapy

SIR,—Abstracts of proceedings which appear in the *Journal* from time to time must necessarily cover the subject-matter of discussions in broad outline and without reference to what might be termed "intercalary detail." I do not know whether Dr. Horace Hill was present at the recent discussion on this subject at the Royal Society of Medicine, but his letter (March 4, p. 475) suggests that if he was present I failed to make clear in the discussion certain aspects of experimental work which seem to show quite clearly the manner in which shock therapy achieves its effect. I would refer Dr. Hill especially to the work of G. W. Day and Niver (*Texas State J. Med.*, 1937, **33**, 236), Gellhorn (*Arch. Neurol. Psychiat.*, 1938, **40**, 125), and L. Angyal (*Mschr. Psychiat. Neurol.*, 1937, **97**, 280).

I think he will agree after perusal of these that neither shock nor hypoglycaemia *per se* is the factor which achieves the change in the psychiatric state. The essential factor is the *sudden* fall in the cerebrospinal fluid sugar in the case of insulin therapy, and the *sudden* vascular (and therefore oxidative) changes in the nervous system in the case of analeptics. The effect of these changes is to stimulate a high degree of sugar–oxygen hunger in the cells of the nervous system, so that a state of biochemical stagnation is overcome. Even, however, if one does not care to go very closely into these biochemical intricacies, notwithstanding the fact that in particular the clinical work of Day and Niver is extremely strong evidence for their validity as a practical explanation for the effects of shock therapy, it is clear that a casual comparison of the effects of other forms of shock in psychiatric cases with insulin or analeptic shock shows the essential difference that patients do not recover after the former, whereas they do after the latter. Probably every psychiatrist has seen examples of profound surgical shock, anaphylaxis, such as that which may be induced by protein shock, and of course the state of shock which may exist in abdominal emergencies. I have, however, yet to see a case of schizophrenia which has been cured by intestinal obstruction. There must be a difference, and I think that the authors I have quoted have done sufficiently convincing work to show what the difference is.—I am, etc.,

Aylesbury, March 4. IAN SKOTTOWE.

Copper and Cobalt in Anaemia

SIR,—Mr. H. H. Corner's letter in the *Journal* of February 25 (p. 415) on the use of cobalt in the treatment of "pine" disease among sheep concludes with the suggestion that a trial of cobalt in the nutritional anaemias in man might be worth making.

In 1937, following the work of Filmer and Underwood on the treatment of enzootic marasmus in Australian sheep, and impressed by the clinical similarity of that disease to human hypochromic anaemia, Dr. Janet Vaughan suggested the trial of cobalt as a haematinic. Eight cases were so treated, with results which were almost entirely negative.

Cobalt in the form of the chloride was made available by the courtesy of British Drug Houses in tablet form, each tablet containing 2 mg. of the metal, this being the corresponding quantity, weight for weight, to the minimal effective ovine dose. Dosage was started at 2 mg. daily, and was cautiously increased until as much as 30 mg. daily was being given. This latter dose is well within the quantities given by Le Goff, who administered 90 mg. daily over a period of one hundred days to a man without the appearance of toxic symptoms. The period of treatment of our series varied from ten to thirty days, and the total maximum dosage in any one case was 630 mg. in twenty-six days. In three cases mild toxic symptoms appeared shortly after treatment had been started; three showed anorexia, two nausea, one vomiting, one pruritus, and one urticaria. On stopping treatment the symptoms disappeared, nor did they return on subsequent administration of the drug.

The patients were all suffering from hypochromic anaemia of moderate to severe degree. Five had directly followed or were associated with haemorrhage, two were definitely nutritional in origin, and one was associated with hypertension. Preliminary observations on the blood were carried out for periods up to fourteen days before cobalt was given, and thereafter were made every day or every other day, particular attention being paid to the reticulocyte count as a measure of progress. After the period of administration iron was given to each case and the results were compared.

In none of the cases, save one possible exception, was there any reticulocytosis in response to cobalt. Nevertheless on the completion of the course there was found to have been an average daily gain in red cells of 18,800 and in haemoglobin of 0.11 per cent. These figures, however, compared unfavourably with the response to iron in the same cases, the average daily gains being 46,000 and 0.88 per cent. respectively. Cobalt brought about no clinical improvement, no stimulation of appetite, no restoration of energy, no resultant euphoria. On the contrary it was, through its mildly toxic action, inclined to depress.

It is true that the period of cobalt administration in this small series cannot compare with that of the Australian experiment, which over a period of three months or more

yielded such striking results in the improvement in red-cell and haemoglobin content of the blood and in general well-being of the animals. But the lack of any reticulocyte response to the administration of cobalt was sufficient indication of its comparative uselessness as a haematinic in the hypochromic anaemia of man.—I am, etc.,

British Postgraduate Medical School, Hammersmith Hospital, Feb. 25. C. R. BAXTER.

Blood Transfusion in Obstetrics

SIR,—Now that Dr. Bethel Solomons (*Journal*, February 11, p. 298) has declared his belief "that transfusion has a place in obstetrics" there would appear to be no point of major dispute between us. The selection of cases suitable for its use must obviously depend on individual judgment. No attempt was made in my plea to question the great value of saline mixtures; rather was the need stressed for giving these until blood could be obtained for those cases in which transfusion was indicated. Three fatal cases, selected at random, were presented not with any idea of criticizing the general efficacy of saline therapy but to illustrate that haemorrhage may be so severe that saline by itself is inadequate. It was *not* suggested that blood should be given as a routine in all cases of haemorrhage, or that it should be given instead of saline.

One blood transfusion was recorded to illustrate the value of the drip method in assisting recovery after severe haemorrhage. It was not claimed that a life had been saved in this case, but it is certain that the speed of the patient's restoration to normal health was greatly increased. This fact was clearly stated, but has been overlooked by several readers. Incidentally, it is not "absurd"—Dr. Gibbon FitzGibbon's expression (February 25, p. 411)—that in the case recorded the haemoglobin was 30 per cent., for, as often occurs, there had been recurrent haemorrhage before the final severe one, and the compensatory restoration of blood volume had diluted the haemoglobin to a dangerous level. Unfortunately, continued or repeated haemorrhage often results in an overstepping of the patient's tolerance both to reduction of blood volume and to the diminution of the oxygen-carrying properties of the blood, and this too often occurs at the time when operative procedures could still successfully staunch the continued loss of blood.

Dr. G. J. Ryan (p. 411) has never seen a patient die from haemorrhage, and he must be congratulated. He gives an interesting account of a woman *in extremis* from blood loss—"her face was purple, fingers blue . . . noisily fighting for breath with mouth wide open and chest heaving." There was a heroic administration intravenously of a gallon of saline in less than three hours, and the patient recovered. Diagnosis is, however, difficult to justify on the data given, and it may be suggested that the response would have been still more dramatic had Dr. Ryan cleared this patient's airway and omitted the infusion. A venesection would appear more rational than an infusion in such a patient.

Figures were not given in connexion with lives saved by transfusion for the reason that it would be impossible to prove that a patient would have died had transfusion not been administered. When, however, a patient is reported to have died from haemorrhage there is strong presumptive evidence that the treatment given was inadequate; figures were therefore given relative to death occurring from this cause. The criticism that many fatal cases would survive if better obstetrical treatment were practised will be generally accepted. Much as one could desire that the general standard of obstetrical skill was as high as that revealed by Dr. Solomons in the most excellent series to which he referred, the fact remains that it is not. At the same time I would suggest that it is no more reasonable for a skilled obstetrical specialist to expect general practitioners, however careful and conscientious they be, to treat 138 cases of placenta praevia with only two deaths than it would be for a neurosurgeon to expect the obstetrical specialist to treat a similar series of cerebral tumours with a correspondingly low mortality. Emergencies due to haemorrhage will therefore unfortunately continue to arise and demand the most effective method of treatment.

In conclusion I would again state that my plea for transfusion was in no way intended to disparage the use of saline, in which I am a firm believer. Its purpose was to combat the defeatest attitude that if a patient fails to respond to saline therapy she cannot be saved. This, I believe, is contrary to fact, is unimaginative, and is responsible for an unnecessary waste of life.—I am, etc.,

Oxford, Feb. 27. JOHN STALLWORTHY.

*** This correspondence is now closed.—ED., *B.M.J.*

Cyclopropane and Pulmonary Atelectasis

SIR,—Although my intervention in this small controversy may be rather belated, I should like to express my emphatic agreement with the views expressed by Dr. Philip Ayre in your issue of December 17, 1938 (p. 1279). There is ample evidence that exposure to high concentrations of oxygen, especially if prolonged, is deleterious. It is unfortunate that Dr. M. H. Armstrong Davison is at some pains (January 7, p. 35) to discount the gravity of this circumstance in relation to cyclopropane anaesthesia. His instances of high-altitude flights and oxygen therapy are hardly comparable, since, apart from the probable presence of some nitrogen in the atmosphere breathed, the subjects concerned are conscious, or at any rate able voluntarily to maintain a patent airway.

This is the crux of the question. Should obstruction develop during or after an operation in which any volatile or gaseous agent is being used in a vehicle of oxygen a grave danger of localized or extensive pulmonary collapse arises. Such obstruction may be due to hypersecretion of mucus, laryngeal spasm, or a fallen-back tongue. Impaired ventilation from posture, shallow respiration, and other causes may operate similarly. Because of the large excess of oxygen in the lungs and the resultant continued oxygenation of the blood, the abnormal situation may pass unnoticed for some minutes. Meanwhile the volume of the pulmonary contents is decreasing rapidly, especially if tissue saturation with the anaesthetic agent is only partial. Carbon dioxide output is also arrested as the tension of this gas rises in the diminishing pulmonary atmosphere. Equilibrium will, of course, finally become established, but with a greatly decreased total lung content. If such a situation is allowed to progress to an extensive degree massive pulmonary collapse is inevitable.

Bearing in mind the above possibilities, my practice in recent months with cyclopropane has been invariably to give atropine or hyoscine as a preliminary measure and to use nitrous oxide for dilution of the anaesthetic mixture. Of course no actual deprivation of oxygen is permitted. Should laryngeal stridor develop a constant slight positive pressure on the rebreathing bag will almost invariably overcome it in a few moments. Towards the end of the administration the rebreathing bag is allowed to become nearly deflated, and then air is admitted in increasing

amounts. There is no reason why air should not be used throughout, as Dr. Ayre suggests, as a diluent, and his initial partial filling of the bag with air instead of oxygen is an eminently rational procedure.

The whole problem is very ably discussed by Dr. G. E. Burford in *Current Researches in Anesthesia and Analgesia* for September–October, 1938 (**17**, 241), and all anaesthetists would profit by a study of his conclusions.—I am, etc.,

Sydney, Australia. S. V. MARSHALL.

Physiology of the Vocal Mechanism

SIR,—I have just been reading in the *Journal* of December 10, 1938 (p. 1189), an article on voice production by Dr. Douglas Guthrie. I regret that I cannot agree with him in his description of the mechanics of phonation. He says that the cricothyroid muscles produce the tension of the cords in falsetto, while the thyro-arytenoids produce the tension for the true pitches. This is surely not right! Falsetto is above the range of true voice in a particular individual. The cricothyroids, if they produce sufficient tension to give these high notes, must be under terrific strain and the cords must be extraordinarily taut, necessitating a terrific blast of air from the pulmonary bellows. As a matter of fact, anyone who has observed singers trying to get high notes above their physiological range will notice that as soon as falsetto is entered upon there is a relief of strain and a reduction in the propelling power of the pulmonary bellows. Dr. Guthrie also says the cords vibrate in their length and not transversely, or vertically as he calls it—that is, when the voice is produced correctly. He suggests that in falsetto the cords vibrate vertically, or transversely. With a monochord there are two ways of producing the same note: (1) rubbing with the felt parallel to the wire; and (2) rubbing transversely, as is done with a bow on violin strings. As a matter of physics, vibrations occur always in the two directions, if not more; this can be seen in the tuning-fork where the prongs vibrate transversely, and the prongs and stem vibrate longitudinally, but the note is the same because the pitch is equal to the amplitude multiplied by the wavelengths.

Dr. Guthrie suggests that the cords are made to vibrate in their length by the thyro-arytenoids, and that the vibrations are communicated to the air as it passes through the chink, and that these vibrations are amplified in the tubes of the upper larynx and pharynx (this amplification we all agree with). I am inclined to think that this theory is a bit of guess-work. What makes the loudness of a note? The same current or blast of air should be used for all pitches; loudness will require a deeper blast of air, making greater amplitude of vibration but not increasing the cycles. Dr. Guthrie says that the note is produced by the rhythmic contractions and relaxations of the thyro-arytenoids. I cannot believe this at all. He also says that no one nowadays believes that the cords vibrate like a violin string or a monochord. That is a very categorical statement, which is far removed from fact. I think that the cords do act like violin strings or reeds placed inside a pipe, like the reed of an organ pipe; that the varying notes depend upon the fingerers or dampeners of the cords (the thyro-arytenoidei interni) acting like the violinist's fingers on his strings; and that the general tension of the cords is produced by the cricothyroids acting upon the cords just as the screws of a violin act upon the strings. The blast of air coming through sets the cords in vibration, mainly transversely, though according to the physicists they vibrate in other directions as well, and this may be part of the cause of the timbre of a voice, and the note corresponding with the number of cycles per second is produced and amplified above or below the cords.

The stopping or dampening is carried out by the contractions of the bundles of the thyro-arytenoidei interni, which are better developed in some than in others. Those in whom they are better developed can reach a higher pitch naturally than those in whom they are not so well developed. These fibres reach, probably, not beyond the junction of the anterior and middle thirds of the cords, and it is about this point, or anterior to it, that ruptures take place in those who are naturally unable to produce certain high pitches, and therefore have to bring into play additional stretching of the cords by the cricothyroids. We know how much increased tension by the cricothyroids in the case of the cords, or the screw in the case of a monochord, is required to get a small elevation in the pitch. The same applies to the violin string. This increased tension necessitates a terrific blast from the pulmonary bellows, and often is followed by rupture. Falsetto, I think, is due to the alteration of the larynx from the type of a reed-pipe to the type of a flue-pipe in an organ. Here the cords are kept rigid and do not vibrate; the note is now produced by the air passing across a rigid edge with both cords in very close apposition, and the vibration is caught up first in the ventricles and then in the upper larynx, where it is amplified. The range of a falsetto is very small, and I believe the pitches in that range are determined by the action of the ventricular bands altering either the size of the ventricles or contracting or enlarging the lumen of the upper larynx, producing thereby a varying number of flue-pipes, which we see in an organ.

Dr. Guthrie goes on to say that there are no head-notes—the vibrations of the air cannot be transmitted to the air in the nasal sinuses because the ostia are so small. Surely he has forgotten his physics, for sound can be transmitted through many solids (and the walls of the sinuses are not very solid) from one mass of air to another. All he has to do is to blow a bugle near a piano and he will hear certain of the piano strings resonating to the note, with its harmonics, of the bugle. I believe that the sinuses add to the vibrations in the air columns above the cords, and that these give an added richness to the quality of the high notes of the human voice. In the same way the lower notes resonate in the thorax, as anyone can determine for himself by using the very pulmonograph which Dr. Guthrie uses to record the varying blasts of air from the pulmonary bellows. To prove my statement, I suggest that a rubber bulb be placed inside the antrum of someone who has an artificial opening into the antrum. It could be done during a Caldwell-Luc operation under a local anaesthetic before the naso-antral wall is attacked.—I am, etc.,

Christchurch, New Zealand, Jan. 26. T. A. MACGIBBON.

Chronic Maxillary Sinusitis

SIR,—In the annotation in the *Journal* of January 7 (p. 24) on chronic maxillary sinusitis, in which the work of Larroudé of Lisbon is reviewed, the following statement, or rather quotation, occurs: "The operation [Caldwell-Luc] should never be performed in children under 12 years of age, because it would destroy the tooth germs of the second dentition." Can you or any of your readers tell me where in oto-rhinological literature

there occurs any clinical confirmation of this opinion—that is, publication of a series of cases in which it has been shown that tooth germs have been destroyed owing to this operation?

My own observations, published in the *Medical Journal of Australia* of September 18, 1937, indicate that the objection is purely theoretical and that no harm comes to the secondary dentition. Conversely, T. G. Millar found that in a series of children of similar age there was no improvement clinically or radiologically after the endonasal operation, although the opening remained patent (ibid., October 22, 1938). He came to the following conclusions: (1) The endonasal operation is useless after preliminary lavage has failed; (2) the operation will not cure gross pathological conditions of the antral mucous membrane. When maxillary sinusitis is diagnosed in a child the nasal history is often a lengthy one, and the indications for a Caldwell-Luc operation are just as definite as in an adult. But until this bogy of dental damage is disposed of doubtless the differences of opinion as to treatment will continue.—I am, etc.,

G. A. D. MCARTHUR, M.D., F.R.A.C.S.

Melbourne, Feb. 14.

Corporal Punishment

SIR,—The corporal punishment clauses of the Criminal Justice Bill are rousing much discussion and strong feelings on one side or the other. At the Standing Committee Sir Samuel Hoare remarked a few days ago, apropos of another clause, that "in this Bill we are trying to face facts and to deal with them realistically." That phrase might with advantage be taken as a motto by those who discuss the question of corporal punishment as a judicial punishment. The opponents of flogging and birching are often accused of sentimentality and emotionalism, but in fact those who want to maintain them are also all too often swayed by emotion rather than by reason. The desire that society should revenge itself on the evil-doer is deeply rooted in many people, but is this desire for revenge reasonable if it can be shown that it serves no practical purpose?

The Departmental Committee on Corporal Punishment examined all the possible evidence to see whether corporal punishment does in reality serve the practical purpose of restraining the potential criminal or preventing those who had once experienced the physical pain of the "cat" or the birch from committing other offences. The Committee was composed of men and women who had no preconceived views on this problem; they were absolutely open-minded on the subject, yet they came unanimously to the conclusion that corporal punishment had no special value as a deterrent. They showed, for example, that robbery with violence has decreased more in Scotland, where it is not a floggable offence, than in England, where it is; they showed that the after-history of the men flogged was worse than the after-history of those who had committed the same type of offence but had not been flogged. They examined all the instances usually quoted to show the value of flogging, and found that the conclusions generally drawn were not supported by facts.

Anyone who wishes more exact information on the subject can obtain an abstract of the report, price 2d., by writing to the Howard League for Penal Reform, Parliament Mansions, Victoria Street, S.W.1, though of course it would be better still if they would read the report itself.—I am, etc.,

CICELY M. CRAVEN,
Hon. Secretary, Howard League.

March 6.

Obituary

SIR HUGH BEEVOR, BT., M.D., F.R.C.P.

Consulting Physician, King's College Hospital

Sir Hugh Beevor, fifth baronet, of Hargham Hall, near Norwich, died in a nursing home on February 24 at the age of 80. He had long retired from active practice as a physician in London and lived the life of a Norfolk country gentleman, for which he was well fitted. He had an expert knowledge of trees and other plants and took a leading part in the work of the English Arboricultural Society.

Hugh Reeve Beevor was born on October 31, 1858, the second son of Sir Thomas Beevor, fourth holder of a baronetcy created in 1784. He left Felsted School to study medicine at King's College, London, and remained in close touch with King's College Hospital for the rest of his professional life. Having qualified with the M.R.C.S. and L.S.A. diplomas in 1882, he graduated M.B.Lond. in 1884 and M.D. in 1892, obtained the M.R.C.P. in 1888, and was elected a Fellow of the Royal College of Physicians of London in 1896, afterwards serving for four years as examiner in medicine. At King's College Hospital Sir Hugh Beevor had been house-physician and Sambrooke medical registrar; he was appointed assistant physician in 1890 and physician in 1899. He succeeded Professor John Curnow as dean of the Medical School in 1896 and held that post for two years; he was appointed a Fellow of King's College, London, in 1909. On the formation of the Territorial Army he received a commission as Major R.A.M.C.(T.) on the *à la suite* staff of the 4th London General Hospital. He resigned his office as physician at King's in 1914 and was appointed consulting physician to the hospital; he had also been for many years physician to the Hospital for Diseases of the Chest, Victoria Park. He was one of the founders in 1903 of the King's College Hospital Lodge of Freemasons. From 1900 to 1910 he represented the Apothecaries Society of London on the General Medical Council. A member of the British Medical Association for a good many years, he took part in the Annual Meeting at Portsmouth in 1899, and in 1900 at Ipswich read a paper before the Section of State Medicine on rural phthisis and the insignificance of case-to-case infection; he also joined in the discussion on the provision of cottages in rural districts and its bearing upon public health. In later years he read papers before the Chichester and Worthing Division and the St. Pancras and Islington Division.

After retiring to Hargham Sir Hugh Beevor continued the studies on forestry which had long occupied his leisure, and took part in local public business, as an alderman of the Norfolk County Council for eighteen years. His elder brother had died in 1879, unmarried, at the age of 25, and he succeeded his father in the baronetcy in 1885.

F. G. CLEMOW, C.M.G., M.D.

Late Delegate for Great Britain, International Board of Health, Constantinople

We regret to record the death at Ealing on February 25, in his seventy-seventh year, of Dr. Frank Gerard Clemow, long recognized as an authority on international hygiene.

He was educated at the Royal Institution School, Liverpool, and at Edinburgh University, where he graduated M.B., C.M. in 1885, proceeded M.D. in 1892, soon afterwards obtaining the Cambridge D.P.H. His earliest

appointment, held for ten years, was that of medical officer to the British Seamen's Hospital, Kronstadt, Russia, where he gained first-hand experience of a cholera epidemic. He then engaged for a short time in plague work in India, and in 1900 was appointed physician to the Embassy and British delegate on the International Board of Health at Constantinople, positions which he held for twenty-two years, during which time he also served as British delegate to the international sanitary conferences in Paris. He was in charge of the British Red Cross Missions to Montenegro in 1915–16, and to Rumania and Russia, 1916–17; and director of the Serbian Relief Fund in Serbia, 1918–19. Dr. Clemow was also a member of the British delegation at the Lausanne Peace Conference in 1923, and British representative of successive international commissions to inquire into the sanitary defences of the coasts of Asia Minor, Syria, and Arabia, of the Hedjaz Railway, of Mesopotamia, and the Turco-Persian frontier. For his services to hygiene and the relief of suffering he was created C.M.G. in 1914, and he also held the Montenegrin Order of Danilo I and Red Cross medal, and the Russian Order of St. Anne, 2nd Class with Swords.

Dr. Clemow's publications included *The Cholera Epidemic in 1892 in the Russian Empire*, a book *Geography of Disease*, published in 1903, the section on medical geography in Allbutt and Rolleston's *System of Medicine*, and various papers on epidemiological subjects published in the *Lancet*, the *Times*, *Blackwood's Magazine*, and the *Geographical Journal*. He had been a member of the British Medical Association for thirty-eight years, and had served as honorary secretary for the Near East of the Epidemiological Section of the Royal Society of Medicine.

Dr. ERNEST HAMILTON CRAMB died suddenly at his residence in Dalmuir, Dumbartonshire, on February 20. Born at Bonnybridge, Stirlingshire, he went to Dalmuir as a child, where he was educated. In 1901 he graduated M.B., Ch.B. at Glasgow and in 1910 D.P.H. He was a resident in Glasgow Royal Infirmary, and later in Ayr County Mental Hospital. In 1903 he took up general practice at Old Kilpatrick, and gradually transferred to Dalmuir and Clydebank, where he continued in active practice till his death. He was the oldest established practitioner in the area, with thirty-six years of service. He was a prominent member of the British Medical Association, which he joined in 1905, and one of the most active in the West of Scotland, being particularly interested in medical politics, and to this he gave much time and energy. He was zealous in safeguarding the interests of the general practitioners, and took an active part in the struggle at the inception of the National Health Insurance Act in 1913. For many years a member of the Council of the Glasgow and West of Scotland Branch of the Association, he was branch president in 1933–4. He was also a member of the Scottish Committee from 1930 to 1938, and for a time also of the Scottish Insurance Acts Subcommittee. In his home Division Dr. Cramb was most active, and for many years had continued as a member of the Executive Committee. He was also a member of the Clydebank Medical and Panel Committee and its chairman for a time. A man of outstanding and original character, his logical, active, and receptive mind was especially telling in debate; his tenacity of purpose was dauntless and his courage indomitable. Amid his many activities he found relaxation and much pleasure in philately and in his rose garden. By his death the profession locally has been deprived of one of its most outstanding members, and many will join us in mourning his loss and in sympathizing with his widow. The cremation ceremony took place at Glasgow on February 24 and was attended by many, including representatives of all the committees on which he had served.—W. G.

Dr. LEWIS JOHN HOBSON, who died on February 22 at Hastings, was for many years a leading figure in the medical profession of Harrogate, where he served for over half a century on the honorary medical staff of the Royal Bath Hospital and Rawson Convalescent Home. The son of William Hobson, he was born at Eaton Socon, Huntingdonshire, in 1852, and from Bedford School went to study medicine at University College, London. In 1875 he graduated M.B., B.S.Lond., with honours; in 1877 he obtained the F.R.C.S. diploma by examination, and in 1882 he proceeded to the M.D. degree. In April, 1935, Dr. Hobson completed fifty years with the Royal Bath Hospital, and soon after was elected a vice-president in appreciation of his work for the institution. Before starting practice at Harrogate he had been house-surgeon at the Bristol General Hospital and the Newcastle Royal Victoria Infirmary, acting medical officer at the Royal Northern Sea Bathing Infirmary at Scarborough, and he was for many years honorary physician to the York County Hospital. Dr. Hobson had been a member of the British Medical Association for fifty-six years. Besides his work as a general spa physician he was particularly interested in dermatology, and wrote several papers on eczema and psoriasis and on the treatment of common skin diseases at Harrogate. Outside his profession he was a keen salmon fisherman.

The death occurred on February 25 at his residence in Great King Street, Edinburgh, of Dr. JAMES DEVON, F.R.F.P.S., who was well known in connexion with his work for the Prison Commission of Scotland. Dr. Devon was born in the Calton Ward of Glasgow in 1866, and springing from a working-class family, he left school at the age of 10 to take up work. Being a young man of great energy and considerable ambition, he studied assiduously and took the Scottish triple qualification at the age of 27. For a year thereafter he acted as assistant in the pathology department of Glasgow Royal Infirmary, subsequently becoming a house-surgeon there and an assistant medical officer in the city poorhouse. In 1901 he was appointed medical officer in Duke Street Prison, Glasgow, and twelve years later he received the important post of Prison Commissioner. His duties brought him into close practical contact with criminals, and he made a special and thorough study of criminology, contributing various important articles to the literature of this subject. Among his publications were a book, *The Criminal and the Community*, published in 1911, and papers on "Some Causes of Crime" contributed to the *Transactions of the Royal Philosophical Society of Glasgow*, 1908, and "The Criminal, the Criminologist, and the Public," contributed to the *Hibbert Journal*, 1911. Dr. Devon was a ready speaker, and in addition to delivering frequent lectures dealing with the special subject in which he was interested, he was in much demand as a speaker at Burns Festivals. In prison administration he had little sympathy for some of the more modern views in regard to treatment of prisoners, holding the idea that prison should be a deterrent and should not be regarded merely as a kind of moral hospital. Dr. Devon was twice married, and is survived by a widow and two daughters, of whom one is a member of the medical profession.

Dr. JAMES BREMNER, who died on February 26 in London, had been for many years a well-known and much-loved figure in the life of Central London. He was born near Keith, Banffshire, and after taking his M.B., C.M. "with distinction" at Aberdeen University in 1882, he was for some time house-surgeon in Chalmers Hospital, Banff. He then came to London and began in Drury Lane the general practice which claimed his devoted work for no less than fifty years; Dr. Bremner's retirement nearly three years ago was marked, incidentally, by the disappearance from the London streets of the pony and trap which he habitually used. He had been a member of the British Medical Association for thirty-eight years.

The following well-known foreign medical men have recently died: Dr. LUDWIG HEIM, for many years professor of hygiene and bacteriology at Erlangen University, aged 82; Dr. HERMANN VESPERMANN, Ministerial Chancellor of the Reich Aviation Office, aged 42; and Professor ARNOLD WINTERNITZ of Budapest, an authority on the surgery of the lung, aged 66.

Medico-Legal

AN ACTION FOR LIBEL

Two certified midwives, sisters, named Miss Frances Buckley and Mrs. Jane Brookes, brought an action before Mr. Justice Greaves-Lord on February 16 against the British Medical Association, one of its honorary division secretaries, and Dr. Irene Gayus. They charged the B.M.A. with libel, alleging that Dr. R. W. Durand, when he had been assistant medical secretary, had written a letter to Dr. Gayus containing statements that the plaintiffs performed criminal abortions at the maternity home of which they were proprietors. The Association had pleaded in its defence that the words were contained in a letter to a member which was marked "private and confidential," and which did not show on its face that the words applied to the plaintiffs. It had merely been sent in answer to an inquiry by the member. The Association decided, however, not to contest the action on the ground of privilege, but to admit that there was no truth in the accusations and to offer a full apology and compensation. His Lordship approved of the terms of settlement.

Case Against Dr. Gayus

In the action against Dr. Gayus, evidence was given that her husband had a child by a former wife, which had been placed in the charge of the plaintiffs at their maternity home. He took divorce proceedings against the mother and made several applications for the custody of the child, but the court would not grant it until November, 1935. In February, 1936, Dr. Gayus, then Dr. Irene Kenworthy, went to the offices of the Association and told Dr. Durand that she had heard that illegal practices were carried on at the home, and asked him to make inquiries, saying she thought of sending a patient there. Dr. Durand telephoned to the honorary secretary of the Division concerned and wrote to Dr. Gayus the letter of which complaint was made. Dr. Kenworthy later married the father of the child, who had at the time of his first marriage been a Mr. Borham and had changed his name to Gayus.

Miss Buckley gave evidence that her home was carried on regularly and properly. Mr. R. F. Levy, K.C., explained that the letter had come to the knowledge of the plaintiffs because Dr. Gayus had passed it on to her husband, and he had produced it before the judge in chambers to support his application for the custody of the child.

Mr. Justice Greaves-Lord, in his summing-up, said that the jury might think that the inquiry which Dr. Gayus had made from the B.M.A. was made from quite proper motives and that she had adumbrated the statements about the home merely for the purpose of ascertaining their truth or falsity. On the other hand, the plaintiffs were not strangers to Dr. Gayus: they had for some time had custody of the child of the man whom Dr. Gayus meant to marry. The jury might think it was rather a curious thing to make an inquiry about their home purely with the intention of putting one of her patients there. If what she said was true, she was proposing to send her patient to a home with which her future husband was in violent controversy. His Lordship asked what they thought of a man who, knowing that certain statements were untrue, circulated a letter containing them. Nobody could now say that the plaintiffs had been guilty of being associated with the practice of abortion, but in making that denial public Dr. Gayus had played no part. The jury awarded each of the plaintiffs £400 damages.

Medical Notes in Parliament

Air Estimates and Army Estimates for 1939–40 and Supplementary Estimates for several services in the financial year now expiring were down for discussion in the House of Commons this week. The latter included a supplementary vote for Broadmoor Criminal Lunatic Asylum.

The Cancer Bill passed through report and third reading in the House of Commons on March 7.

MEDICAL SERVICES IN WAR

Preparations for air raid precaution services were debated by the House of Commons on March 1 and 2 on the vote for the salary and expenses of the office of Lord Privy Seal. On March 1 Sir John Anderson dealt with general policy and with the provision of shelters. On March 2 Dr. ELLIOT described the emergency organization of medical and hospital services. He said that in each of the twelve regions into which the country was being divided the senior regional officer would be a senior administrative officer of the Department and would be assisted by a medical staff. He would represent the medical services and certain branches of civil engineering services in the region. His function would be primarily that of assistance and advising local authorities. The regional medical staff would be concerned both with the normal peace-time public health and national health insurance services and with the treatment of casualties. Treatment of casualties was, for the moment, under the control of the hospital officers of the Ministry of Health. One had been posted in each region for several months working with the local authorities and the voluntary hospitals. It had been intended for some time that the medical staff should be regionalized and that the officers should live in the region. That was now being put into operation, and the hospital officers would become part of the Ministry's medical organization whether there was an emergency or not.

The principal regional medical officer appointed in each region would work with the local emergency committees representing the medical profession which had been set up to regulate the supply of medical personnel. This officer should be aware of any sudden drafts of doctors which might deplete the ranks of general practitioners, for the general practitioners would still be essential in health insurance work and general practice. But the main emergency activity of the principal regional medical officer would be to superintend arrangements for the reception and treatment of casualties. He would work through the hospital officers. He would not supplant the county medical officer but would represent the Ministry in the region, and in emergency county and borough medical officers would get access easily to him. He would be a permanent officer from the Department who would go down to the region.

PROPOSED HOSPITAL ORGANIZATION

The Defence Ministries predicted that the problem which the hospital organization must be designed to meet was one of a very large number of casualties coming suddenly and tending to taper off. To deal with this the Ministry proposed to work so far as possible through existing hospitals and hospital organizations both municipal and voluntary, with the one great exception of Greater London, for which a special organization had been worked out. At present there were 500,000 institutional beds in England and Wales, of which 130,000 were in mental hospitals. These should be organized into a co-ordinated single system to receive casualties occurring among either the civil population or the fighting services. A casualty was a wounded person and until convalescence would be treated from the point of view of injury and not of occupation. This great hospital system contained a proportion of spare beds and a number of persons who were on the point of leaving. It was estimated that by making use of those two facts approximately 120,000 hospital beds could be made available in England and Wales within twenty-four hours.

It would be necessary to transfer a number of patients from evacuation areas to reception areas, but that did not make additional beds available.

The next stage was to increase bed accommodation. To introduce additional beds into certain hospitals and institutions, 80,000 extra beds and bedding would be available in the first twenty-four hours, and accommodation for a further 100,000 beds could be made within the existing hospital system by taking up ancillary buildings. Therefore 300,000 beds could be made available for casualties within the existing hospital system, and 200,000 would be available within twenty-four hours. Originally the emergency hospital organization was conceived in terms of casualty clearing stations and base hospitals. It was realized, however, that any hospital might at any time be called upon to treat local casualties or to receive for prolonged treatment casualties transferred from other hospitals. For that reason the Government had decided to relieve local authorities of all direct responsibility for the organization of hospital accommodation. The Government would undertake the whole of this service with assistance from the authorities. The idea of casualty clearing and base hospitals should not be entirely abandoned, and the general organization was founded on the assumption that arrangements could be made to move casualties with little delay from presumed danger areas to rural and semi-rural areas presumed to be comparatively safe. Details of the hospitals organization were explained in Emergency Medical Services Memorandum No. 2, recently issued from the Ministry of Health.

An important feature of the emergency scheme was a proposal to link casualty hospitals in danger areas both to each other and to selected hospitals in outer areas. This would enable arrangements to be made in advance for spreading the medical and nursing personnel and the equipment and also for the evacuation of patients from the danger areas to hospitals outside. Some hospitals in rural areas which were to be base hospitals for larger towns had at present neither staff nor surgical equipment on the scale necessary, and some equipment and personnel would have to be sent to them. Hospital officers of the Ministry of Health were consulting with hospital authorities and working out this affiliation scheme.

Special Plan for London: Group Officers

For the London region an affiliation scheme had to be worked out in detail as it was not intended that casualties should be retained for treatment in London. There were 50,000 existing hospital beds in the County of London, most of them first-class surgical beds, and it was considered that only a proportion of the beds in the larger general hospitals should be kept in commission for casualties and only a proportion of the medical and nursing staff need be retained. A novel scheme had been worked out which would extend outside Greater London. The London region had been divided into ten sectors radiating from Charing Cross, each having at its apex one or more of the great teaching hospitals. These hospitals, together with municipal and other hospitals in the same sector, were linked to hospitals and institutions in the Home Counties which could be expanded into base hospitals. In air raids over London casualties received in the inner hospitals would be evacuated along each sector to the institutions outside, which would be staffed and equipped so far as practicable from the inner hospitals in which occupied beds would substantially be reduced. A group officer would take a whole sector as his charge.

In consultation with the twelve London teaching hospitals, representatives had been appointed designated "group officers." The responsibility of each would be to work out a plan for his own sector in advance of an emergency in collaboration with the Chief Medical Officer of the London County Council and the medical officers of health of the hospital authorities outside. Fees would be paid to these group officers, who were:

Sector A.—Sir Girling Ball, F.R.C.S., and C. A. Joll, F.R.C.S.
Sector B.—Norman Lake, F.R.C.S., and Wilfred J. Pearson, M.D., F.R.C.P.
Sector C.—E. Rock Carling, F.R.C.S., and C. H. S. Frankau, F.R.C.S.
Sectors D and E.—Russell Howard, F.R.C.S.
Sector F.—Professor T. B. Johnston, M.D.
Sector G.—C. Max Page, F.R.C.S.
Sector H.—H. E. A. Boldero, M.D., F.R.C.P.
Sector I.—Sir Charles Wilson, M.D., F.R.C.P.
Sector J.—John B. Hunter, F.R.C.S.

Thus the London hospital plan would be operated on lines approved by leaders of the profession, and those who would be in charge of it in war were in charge now. They were working in collaboration with Sir Frederick Menzies, Chief Medical Officer of the London County Council. The sectors overlapped the Home Counties in each direction and ran up to fifty miles outside London all round, so that important institutions would not be ruled out because they were just outside the administrative boundary of Greater London.

Supply of Personnel

Turning to the problem of hospital personnel, Dr. Elliot said surgical teams would be assigned to appropriate hospitals in the group, and mobile surgical teams would be organized to deal with exceptional pressure at any hospital or elsewhere. Additional personnel would be supplied from the register of 45,000 doctors established by the Central Emergency Committee set up by the British Medical Association. Local sections of this register were held by Local Emergency Committees so that doctors could be easily allocated. Individual doctors would be allotted to hospitals or groups of hospitals in advance of an emergency, and the Central Emergency Committee would reserve a number of practitioners who could be called upon to reinforce the staff of any hospital. The Central Emergency Committee and the Local Emergency Committees were the sole channels through which medical personnel would be supplied.

Trained nurses, like doctors, were limited in number. There were about 100,000 in the country, and a register of them was being compiled by the emergency committee of the nursing profession. That committee, operating locally through medical officers of health, supported by local emergency committees, was arranging to augment the trained personnel by the recruitment and training of women as nursing auxiliaries. A number of hospitals had offered facilities for training. The Pharmaceutical Society had set up a medical emergency committee. There was a similar committee for the dental profession, and he was arranging for a committee for opticians. The committee on the training of auxiliary nurses included representatives of the St. John Ambulance Brigade and of the British Red Cross Society, and it was about to announce its proposals for training.

First-aid Posts and Reserve Equipment

Last December the Ministry of Health took over responsibility for approving local authority schemes for first-aid posts, and in January sent out a circular indicating that these first-aid posts should intercept the walking wounded who did not require hospital treatment and that the attendance of a doctor at each first-aid post would be necessary. Any patients affected by gas would be treated at these posts. Posts capable of functioning at short notice were required, and this would be easily achieved by utilizing buildings already employed for medical purposes. Very small hospitals would not be used for treatment of casualties but would make admirable first-aid posts. The fixed posts should be reinforced by mobile units consisting of a motor vehicle carrying a doctor, a nurse, and first-aid equipment.

Many schemes on these lines had been submitted by local authorities, and medical officers of health welcomed the proposal to use premises already employed for medical purposes. He would send out within a fortnight a circular giving a list of medical and surgical supplies necessary at aid posts, including mobile units. The cost of these reserve supplies, which would be borne by the Exchequer, was estimated at £100 per post, of which £34 was for drugs and dressings. The Government contemplated 2,000 of these first-aid posts. Local authorities were asked to allocate doctors to first-aid posts with the assistance of the local emergency committee. These doctors might be paid in peace-time a retaining fee, which was being settled in consultation with the British Medical Associa-

tion. Local authorities were making good progress with the recruitment and preliminary training of the auxiliary personnel attached to each post.

Two types of ambulance would be required: large ambulances would be used for transferring cases from one hospital to another, and smaller ambulances for picking up casualties in the streets. Arrangements had been made in each region for the conversion into ambulances of buses and vans, and hospital officers were working out operation orders with the bus companies so that ambulance transport would be available at all hospitals from which patients had to be transferred as soon as an emergency developed. The smaller ambulances were the responsibility of local authorities. The Ministry had bought a large number of blankets and had bought and distributed 125,000 stretchers. Another 100,000 stretchers were being ordered. Arrangements were being made to buy centrally the surgical equipment, drugs, and dressings for the hospitals, first-aid parties, and first-aid posts. Orders already placed for dressings included 12,000,000 bandages, 5,000,000 dressings, 13,000,000 yards of gauze, 204 tons of lint, 425 tons of cotton-wool, and 1,500,000 yards of adhesive plaster, all to be delivered by the end of June.

PROTECTION OF HOSPITALS AND AID POSTS

In the memorandum he had issued dealing with structural precautions in hospitals it was proposed to protect windows and doors on ground floors against splinters, to reinforce the structure against collapse, to protect roofs against incendiary bombs and shrapnel, to protect operating theatres by bricking up and sand-bagging windows—if necessary by moving the theatres to the ground floor—and to reinforce basement ceilings. They also had to envisage provision of a certain number of armoured wards. The idea of providing deep dug-out hospitals in which operations would go on during an air raid was based on a wrong conception of what would be possible during a heavy air raid. The safer thing would be to get the patients away from the danger area as soon as possible. The provision of deep dug-outs for the treatment of casualties was limited by engineering factors, and it would be difficult to deal with more than thirty patients an hour in a deep dug-out with a ramp of one in seven at the end of each building. Considerable use might be made of shelters above ground, and first-aid posts would be sand-bagged and otherwise strengthened against damage by bombs or shrapnel. The major proportion of the cost of protecting hospitals and first-aid posts was to be borne by the Government, and the Ministry had agreed with local authorities and voluntary hospitals about the proportions which they should bear. In no case would a voluntary hospital bear more than 30 per cent. of the cost, subject to a limit of £1 per bed. In local authority hospitals the cost to the authorities would not be more than the produce of a rate of one-tenth of a penny.

So far he had spoken of the work in England and Wales, but in Scotland it had proceeded on the same lines. Scotland had been divided into five districts. A hospital officer of the Department of Health for Scotland had been at work in each district and plans for the emergency hospital service had been worked out. Some 16,000 beds would be set free for casualties within a few days from the beginning of an emergency, and a further 2,500 beds would be provided by using the three large mental institutions. There was room in ancillary hospital buildings for another 2,000 beds. The Department of Health for Scotland worked with the Scottish Emergency Committee of the British Medical Association in allocating the services of the 5,000 doctors on the Scottish register. Scottish Emergency Committees for the nursing, dental, and pharmaceutical professions were at work, and responsibility for first-aid posts had been taken over. Appropriate allocations had been made for hospital equipment and for the conversion of buses into ambulances, and the agreements with local authorities and voluntary hospitals which he had mentioned also covered Scotland.

Dr. Elliot then passed to discuss the arrangements for evacuation. In reply to a question whether he was surveying large houses in the country to ascertain which were suitable for hospitals, Dr. Elliot stated that a further survey was being made and careful note taken of larger premises which could be used for accommodation of schools or in certain cases as hospitals.

Mr. ARTHUR GREENWOOD moved a reduction of the Estimate. Further discussion followed, and after a reply by Dr. Burgin the motion to reduce the Estimate was defeated by 213 to 107, and the Estimate was carried.

Criminal Justice Bill: Psychological Treatment

Consideration of the Criminal Justice Bill was continued by a standing committee of the House of Commons on February 21, 24, and 28. On the last date, on Clause 19 (Provisions for probation orders as to mental treatment), Sir DONALD SOMERVELL moved to insert "on the evidence of a duly qualified medical practitioner" so that the clause should read: "Where a court is of opinion that it is expedient to make a probation order and is satisfied on the evidence of a duly qualified medical practitioner that the mental condition of the offender . . ." Two other amendments were on the paper; the first proposed that the medical practitioner should be "experienced in psychological medicine," and the second that he should be "specially qualified by reason of his training and/or experience." Sir Donald said medical practitioners were not divided by any line that Parliament could draw into those who were experienced in psychological medicine and those who were not. It would be impracticable to impose a statutory restriction on those qualified medical practitioners whose evidence could be acted upon under the clause.

Miss WARD suggested that a circular should be sent to clerks of courts drawing attention to the importance of securing a report where possible from persons duly qualified in psychological medicine. Sir Donald Somervell gave an assurance that attention would be drawn by a circular to the importance of this.

The committee agreed to the amendment.

Mr. BENSON moved an amendment to remove the limit of twelve months for psychological treatment. He said that whether the delinquent received one, two, or three hours a week would depend on whether the doctor happened to be busy. There were few psychiatrists outside London, and the patient would be lucky if he received one hour a week. Even the Tavistock Clinic with a waiting list of 500 found that in some cases it was essential to give 400 treatments to one patient. Under the Bill only fifty to a hundred treatments could be given. Mr. RHYS DAVIES urged the committee to consider as a very serious matter a proposal to keep people under supervision and control for an indefinite period. Sir FRANCIS FREMANTLE said that the really progressive movement in mental treatment lay in out-patient work and out-patient clinics. There ought to be no limit imposed upon Justices with regard to out-patient work.

Mr. BERNAYS said the amendment would allow a court to require a probationer to submit to mental treatment during the whole probation period, which might be as long as three years. The maximum of twelve months had been included because that period was long enough to secure adequate treatment for any case likely to yield to it. That was the expert advice which the Government had received. The probationer could continue to receive treatment after the twelve months had expired, not under this Bill but under the Mental Treatment Act, 1930, as a non-certifiable patient.

Sir DONALD SOMERVELL moved that where the clause referred to "mental treatment" the word "mental" should be deleted. He said it had been suggested that the phrase "mental treatment" might be construed as being confined to psychological means and as excluding treatment directed to the mental condition connected with the offence. The amendment would begin by saying that the treatment must be "by or under the direction of a duly qualified medical practitioner." A treatment under the order would be "treatment as a voluntary patient under Section 1 of the Mental Treatment Act, 1930, at such institutions within the meaning of that Act or at such hospital, nursing home, or place approved for the purposes of the said Section 1 or in charge of such persons so approved, as may be specified in the order." The treatment should be "as a

resident patient at such institution or place approved for the purposes of this Section by the Board of Control as may be so specified."

Mr. RHYS DAVIES asked whether by that proviso the persons with whom the committee were dealing would ultimately be under the Board of Control. Sir DONALD said the amendment would not do this. It contemplated that the order should specify the medical practitioner who was in charge and who could then prescribe the treatment he thought necessary. Nothing in the paragraph precluded the medical practitioner, if medical or surgical operation was required, from giving residential treatment in a nursing home or hospital, but that treatment must be under the qualified medical practitioner. There could be no requirement of residence under the subsection dealing with such treatment. It excluded institutional treatment because if a man went into an institution the treatment would be given under the direction of those who ran the institution.

The CHAIRMAN (Major Lloyd George) suggested that the amendment moved by Sir Donald Somervell should be discussed in conjunction with another which proposed to leave out the Board of Control and insert the Minister of Health. Sir FRANCIS FREMANTLE supported the amendment moved by Sir Donald Somervell. The institution must be controlled by an experienced body. He had heard no reason why that body should not be the Board of Control, which was efficient and extremely humane. Mr. RHYS DAVIES said the committee should favour the Ministry of Health because the cases under discussion were in the main not mental cases at all. When a court sent an offender to a place that was authorized by the Board of Control the case at once became a mental one and a stigma was put upon the offender. Mrs. TATE remarked that the Board of Control was under a special vote which was scarcely discussed one year in ten by the House of Commons. For that reason the institutions should be left under the Ministry of Health, in respect of which there was an annual discussion.

Mr. BERNAYS reminded the committee that the Board of Control dealt with non-certifiable cases as well as certifiable. It would not attempt to interfere with the treatment given, but would concern itself only with whether the premises and staff appeared suitable for the reception of patients whose mental condition required treatment. It would not seek to impose any limitation in the type of treatment, provided it was given by duly qualified medical practitioners.

Mr. GEOFFREY LLOYD said the Government would not insist on advising the committee to retain the words "Board of Control" but would be prepared to substitute "Minister of Health." He was not in a position to say exactly how the Minister of Health would exercise his responsibility.

The committee then left out the words "Board of Control" and inserted "Minister of Health" in the amendment proposed by Sir Donald Somervell, and with this change the amendment was inserted in the Bill.

The committee then adjourned until March 7.

Hospital Accommodation in War

Dr. ELLIOT told Sir Thomas Moore on February 23 that the number of hospital beds in England and Wales was approximately 502,000 including mental hospitals, or 371,500 excluding those hospitals. Of the latter figure some 120,000 beds could be freed for use for casualties in an emergency. Sufficient new beds had been obtained or were on order to increase the capacity by 80,000. A further 100,000 beds could be accommodated in existing hospitals if necessary. Plans for new hospital units were under consideration. The fifty camps at present proposed were primarily to supplement billeting accommodation in an emergency, not hospital accommodation.

Working Conditions in Shops

Mr. LESLIE moved on February 24 the second reading of the Shops Bill, to deal with the hours and conditions of work for shop assistants. Mr. H. G. WILLIAMS, moving the rejection of the Bill, said it would apply to over 1,500,000 adults the provisions which the Shops Act of 1934 applied to persons under 18 years of age. Dr. SUMMERSKILL said hairdressers' assistants worked sixty hours weekly in ill-ventilated cubicles. Shop assistants suffered from nervous complaints and varicose veins.

Mr. LENNOX-BOYD said the Government did not quarrel with the aims of the measure. A joint conference of employers and employed had lately presented a unanimous report—the report of the Retail Distributive Trades Conference on Wages, Hours, and Conditions of Employment—which the Government would examine sympathetically.

The Bill was rejected by 135 to 114.

Defective Vision in School Children

Mr. KENNETH LINDSAY stated on February 27 that during 1937, the latest year for which figures are available, 1,700,078 elementary school children in England and Wales were examined at routine medical inspections. Of these, 571,082 were in the first age-group (entrants to school). The vision of such young children is not usually tested unless there are obvious signs of defects. 85,424 children examined at routine inspections during the year were found to be suffering from defective vision (excluding squint) which required treatment, and a further 46,141 were referred for observation. The total of 131,365 represents 11.66 per cent. of the number of routine medical inspections, excluding the first age-group. In addition, 68,180 children were referred for treatment for defective vision, and 16,267 for observation, as the result of special inspections. The number of children found in 1937 to be suffering from squint was 21,606 at routine inspections and 16,169 at special inspections.

Health of Recruits

During the twelve months ended January 31, 1939, 58,261 application forms for enlistment in the Royal Air Force were completed and 11,058 men rejected on medical grounds.

In the calendar year 1935, out of 64,825 applicants for enlistment in the Regular Army 13,222 were rejected by the examining medical officer; in 1936, out of 56,458, 11,102 were rejected; in 1937, out of 52,147, 8,028 were rejected; and in 1938, out of 61,552, 7,546 were rejected.

Of 1,804 Army recruits sent to the Physical Development Depot at Canterbury 1,363 were posted to units as fit, and of 394 sent to the Scarborough Depot 229 were so posted.

Of 65,240 candidates who applied to enter the Royal Navy or Royal Marines during 1938, 25,794 were rejected on medical grounds. Some 45 per cent. of the rejections were on grounds of eyesight, including colour-blindness, 15 per cent. on account of teeth, and 7½ per cent. for ear trouble.

Doctors and Cancer Treatments

Mr. GROVES asked whether the Minister of Health intended to prohibit, under Clause 4 of the Cancer Bill, registered medical practitioners referring to any article calculated to lead to the use of that article in the treatment of cancer when speaking to audiences or writing for groups of people composed of persons other than those mentioned in subsection (4) (*a*) and (*b*). Dr. ELLIOT replied on February 27 that in so far as such statements could be held to be advertisements, he was advised that, subject to the exceptions contained in subsection (5), the effect of the clause was as stated by Mr. Groves.

Deaths from Asbestosis

Mr. THORNE asked on March 1 how many people died since 1931 who had worked at the Cape Asbestos Company's works at Barking, Essex, through inhaling asbestos dust; and if attention had been drawn to an inquest, on February 21, on a woman who had died through inhaling the dust, who had not worked there since 1929. Mr. LLOYD answered that since 1931 there had been thirty-nine deaths from asbestosis brought to the notice of the Factory Department where the worker had been employed at this factory. Great improvements had been made during recent years in the working conditions and,

with one exception, all the cases were due, so far as could be ascertained, to exposure under the old conditions. The case referred to by Mr. Thorne was one of these. Special regulations were made for this industry at the end of 1931.

Alcohol in Road Accidents.—Mr. BURGIN said on February 22 that he was not inclined to believe a large proportion of road accidents could be attributed to drink. The extent to which the consumption of alcoholic liquor by drivers of motor vehicles might have been the contributory cause of accidents was not susceptible of demonstration by statistics. In a special investigation made in 1936 to 1937 it was found that out of nearly 200,000 accidents 1,307 were attributable to drink or drugs as a primary cause, and in 567 cases the driver was the person affected. He was not prepared to introduce legislation under which it would be an offence to drive a motor vehicle within a specified period after the consumption of intoxicating liquor.

Cost of Hospital Defence in Air Attack.—Mr. BERNAYS announced on February 28 that agreement had been reached with the representatives both of local authorities and of voluntary hospitals regarding the extent of the contribution which they would make towards the cost of the protection of their hospitals against the effect of air raids. Under this agreement the Government would bear by far the greater share. Mr. Bernays added that Dr. Elliot was confident that hospital authorities would now proceed with the submission of their proposals.

Diphtheria Immunization in Manchester.—Dr. ELLIOT stated on March 2 that up to the end of 1927 there were 149 cases of diphtheria in Manchester among persons who had received a full course of inoculation. Of these, eighteen were in children under 5 years of age, 129 in persons between 5 and 15 years, and two in persons over 15 years. There were three deaths. He added that as Schick-testing was not carried out as a routine it was not possible to give the figures for Schick-negative persons.

Notes in Brief

Information obtained in 1937 showed that in 146 registered maternity homes in Scotland at that date 747 nurses were employed, of whom 107 were neither certified midwives nor general-trained registered nurses. Mr. Colville thinks the position has not materially altered since that date.

A petition containing 212,539 signatures "against the continued practice of experimenting on living animals in the interests of vivisection" was presented to the House of Commons on March 1.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The Raymond Horton Smith Prize, awarded to the candidate for the degree of M.D. who presents the best thesis for the degree during the academical year, has been gained by M. L. Rosenheim, M.D. (St. John's College) for the year ended September, 1938. J. L. Lovibond, M.D. (Christ's College) and T. F. McNair Scott, M.D. (Gonville and Caius College) were next in order of merit.

The following candidates have been approved at the examination indicated:

M.CHIR.—W. G. Gill, D. B. McGavin.

UNIVERSITY OF LONDON

Sir Ernest Graham-Little, Member of Parliament for London University, has been nominated for re-election at the forthcoming election in May next as a representative of medical graduates of Convocation on the Senate of the University of London.

UNIVERSITY OF EDINBURGH

The Senatus reported to the University Court on February 21 that the Cameron Prize for 1939 had been awarded to Dr. Gerhard Domagk, of the Institute for Experimental Pathology and Bacteriology, I.G. Farbenindustrie, Elberfeld, Germany. The Cameron Prize, of about £200, is awarded to the person who in the opinion of the Senatus has in the previous five years made any highly important and valuable addition to practical therapeutics. This year's award is made in recognition of Dr. Domagk's discoveries which initiated the treatment of diseases of bacterial origin by compounds belonging to the sulphonamide group.

SOCIETY OF APOTHECARIES OF LONDON

The following candidates have passed in the subjects indicated:

SURGERY.—A. N. Boyle, H. J. S. Coldham, A. Dunkerley, D. S. Edwards, K. P. D. Griffiths, E. L. Moll, V. N. Stevenage, W. E. Swanston, T. I. Thomas.

MEDICINE.—H. J. Dismorr, K. R. P. Kent, R. G. Ticehurst.

FORENSIC MEDICINE.—H. J. Dismorr, K. R. P. Kent, R. G. Ticehurst.

MIDWIFERY.—E. Batley, T. Bliss, N. B. Eastwood, D. Harken, H. A. C. Ingouville-Williams, J. R. F. E. Jenkins, W. Simpson, E. Smith, H. F. Sparling.

The diploma of the Society has been granted to H. J. S. Coldham, H. J. Dismorr, A. Dunkerley, N. B. Eastwood, J. R. F. E. Jenkins, K. R. P. Kent, and T. I. Thomas.

The Services

DIRECTOR OF HYGIENE, WAR OFFICE

Colonel J. A. Manifold, late R.A.M.C., Deputy Director of Hygiene and Pathology at Army Headquarters, India, is to succeed Major-General H. H. A. Emerson, Director of Hygiene at the War Office, who is to retire on April 16.

PARKES MEMORIAL PRIZE, 1938

In the absence of any recommendations for the award of the Parkes Memorial Prize for 1938, the committee administering this prize fund has decided to withhold the award for the year referred to. The prize consists of a gold medal and £30, and is awarded annually to the officer who is considered by the committee to have done most to promote the advancement of naval or military hygiene. In awarding the prize for 1939 (and thereafter until further notice) first consideration will be given to original articles or reports of investigations of value from the point of view of naval and military hygiene, and published in one or other of the various medical journals. The prize is open to medical officers of the Royal Navy, Army, and Indian Army, with the exception of the teaching staffs of the Royal Naval Medical College, Greenwich, the Royal Army Medical College, London, and the Army School of Hygiene, Aldershot.

DEATHS IN THE SERVICES

Lieutenant-Colonel LIONEL ARTHUR MITCHELL, R.A.M.C. (ret.), died at Farnborough, Hampshire, on February 25, aged 71. He was born at Monaghan on April 11, 1867, and was educated at Trinity College, Dublin, where he graduated M.B., B.Ch., B.A.O. in 1890. After serving as resident medical officer at Sir Patrick Dun's Hospital he entered the Army as surgeon lieutenant on January 30, 1892, and became major after twelve years' service. For four months in 1908, from August 21 to December 21, he was on half-pay. He became lieutenant-colonel on July 14, 1914, went on half-pay on December 21, 1918, and retired on March 9, 1920. He served in the Tirah campaign on the North-West Frontier of India in 1897–8, when he took part in the operations on the Samana Range and in the Kurram Valley, in the capture of the Sampagha and Arhanga passes and in the operations in the Bara Valley, receiving the medal with three clasps; in the China War of 1900 (medal); and in the war of 1914–18, when he was mentioned in dispatches in the *London Gazette* of October 19, 1914.

Lieutenant-Colonel SORABSHAW HORMASJI DANTRA, Bengal Medical Service (ret.), died at Hampstead on February 18, aged 90. He was born on September 13, 1848, and was educated at the Grant Medical College, Bombay, and at Aberdeen University, where he graduated M.B., C.M. in 1874. He proceeded M.D. in 1877, and took the London D.P.H. in 1889. He entered the Indian Medical Service as surgeon on March 31, 1876, became surgeon lieutenant-colonel after twenty years' service, and retired on July 10, 1903. Most of his service was spent in civil employ in Burma.

Medical News

The Heberden Medal for 1938 has been awarded by the assessors, Dr. C. W. Buckley, Dr. Mervyn Gordon, and Dr. F. D. Howitt, to Dr. Ernest Fletcher for his contribution on "Osteo-arthritis." Dr. Fletcher will lecture on this subject to the Heberden Society on a date to be announced later.

A meeting of the Paddington Medical Society will be held at the Great Western Royal Hotel, Paddington, W., on Tuesday, March 14, at 9 p.m., when there will be a discussion on "Are the Present Arrangements for Medical Defence Satisfactory?"

A meeting of the Royal Microscopical Society will be held at B.M.A. House, Tavistock Square, W.C., on Wednesday, March 15, at 5.30 p.m., when Miss F. M. L. Sheffield will give a communication on "Virus Diseases of Plants, with Special Reference to their Effect on the Cell of the Host."

Air Vice-Marshal Sir David Munro, secretary of the Industrial Health Research Board, will open a discussion on "Industrial Health Research" at the Royal Sanitary Institute, 90, Buckingham Palace Road, S.W., on Thursday, March 16, at 5 p.m.

The London Jewish Hospital Medical Society has arranged a symposium on "Vitamin Deficiencies," to be opened by Mr. A. L. Bacharach and Dr. S. Levy Simpson, at the London Jewish Hospital, Stepney Green, E., on Thursday, March 16. Tea at 3.15 p.m.

The annual convention of the Incorporated Society of Chiropodists will be held in London at the Langham Hotel on Friday and Saturday, March 17 and 18. The programme includes a visit to the Gordon Museum, Guy's Hospital, demonstrations at the London Foot Hospital, demonstrations of medical films and of the work of the Edinburgh School of Chiropody, a visit to the Royal Veterinary College and Hospital, and an address by Mr. E. L. G. McManus, registrar of the Board of Registration of Medical Auxiliaries, on "The History and Aims of the Register." The Lord Mayor of London and the Lady Mayoress will attend the annual dinner on Saturday.

A Dutch National Congress for the Protection of Childhood will be held at Amsterdam from April 11 to 14. The subscription is five florins. Further information can be obtained from the secretary, Professor R. Casimir, Wassenaarweg 28, The Hague.

The sixty-third Congress of the German Society of Surgery will be held in the Langenbeck-Virchow Haus, Berlin, from April 12 to 15.

An International Congress for Sanatoria and Private Hospitals will be held at Baden-Baden from April 23 to 28. Further information can be obtained from Die Kongressleitung, Schlandstrasse 171, Berlin, W.35.

The seventh International Congress of Genetics will be held at Edinburgh from August 23 to 30. Further information can be obtained from the general secretary, Professor F. A. E. Crew, 9, West Mains Road, Edinburgh.

The twelfth Congress of the Deutsche Gesellschaft für Kreislaufforschung will take place on March 25 and 26 at Bad Nauheim under the presidency of Professor Dr. E. Edens of Düsseldorf. The subjects for discussion are (1) the electrocardiogram, and (2) the treatment of cardiac insufficiency. All inquiries should be addressed to Residenzstrasse 32, Dresden-Blasewitz.

A meeting of the Pharmaceutical Society of Great Britain will be held at 17, Bloomsbury Square, W.C., on Tuesday, March 14, at 8.30 p.m., when Mr. L. W. Whiteman will deliver a lecture on "Planning the Dispensing Department of Your Pharmacy."

Professor W. H. Hoffmann, M.D., director of the Finlay Institute, Havana, has been nominated Honorary Member of the Robert Koch Institute, Berlin.

The Association of the French Medical Press celebrated the fiftieth anniversary of its foundation on February 16 under the presidency of Professor Loeper.

The Council of the Bucarest faculty of medicine has decided that the Institute of Nervous Diseases and Electrotherapy shall henceforth be known as the Georges Marinesco Institute.

EPIDEMIOLOGICAL NOTES

Typhoid Fever

The Birkenhead typhoid fever outbreak appears to have subsided, no fresh cases having been reported since last week. The source of the infection does not appear to have been identified so far. Four further cases have been notified in the outbreak at Nottingham since last week, bringing the total to 25; in addition there is one person under observation. One patient has died, a married woman of 32 years. Although contaminated food is believed to be responsible, full bacteriological investigations have not yet been disclosed.

Influenza

Despite the decline in the incidence of pneumonia (primary and influenzal) in England and Wales from 1,919 to 1,616, deaths from influenza rose from 255 to 285 during the week and the general death rate in the 126 great towns from 14.6 per thousand population to 14.9. Of the 285 deaths, 67 (94) were in London, 12 (5) in Leeds, 11 (13) in Bristol, 10 (7) in Rhondda urban district, and 8 each in Sheffield (12) and Nottingham (6). In Scotland 40 cases of influenzal pneumonia were notified, compared with 60 in the previous week, and deaths, at 34, were one less. Notifications of primary pneumonia fell from 288 to 217. During the week the general death rate of the 16 principal towns rose from 13.7 per thousand population to 15.0. In Ireland the disease is on the decline, as shown by the figures of incidence and mortality.

From data received for the week ended February 18 influenza of a mild variety is prevalent in Belgium, Holland, France, Denmark, Hungary, and Switzerland, but a decline has been observed in Switzerland, England and Wales, Hungary, and certain parts of Ireland. In Germany deaths attributed to influenza in the 57 great towns (population over 100,000) rose during the week ended February 11 from 159 to 277, while deaths ascribed to pneumonia rose from 459 to 615. The centres chiefly affected with influenza were Munich 26, Stuttgart 19, Nuremberg 12, Hamburg 15, Bochum 10, and Breslau 9. In Denmark during the week ended February 18, 4,001 cases (6,672 in the previous week) and 5 deaths (7 in the previous week) were recorded at Copenhagen; but despite this decline the general death rate rose from 12.5 to 13.2 per thousand population. In Switzerland in the same week there were 11,564 cases of influenza in twenty-one cantons, compared with 11,753 cases in eighteen cantons in the previous week. In the week ended February 11, deaths from influenza in the 10 great towns were 63, compared with 31 in the previous week, while the general death rate rose from 16.3 to 18.2 per thousand population.

Plague and Cholera in India

In 1938, 21,000 cases of plague were notified in India, compared with 31,000 in the previous year. The provisional data for the fourth quarter of 1938 indicate that the situation is satisfactory in most of the provinces, except in the Central Provinces, in which the seasonal increase was somewhat higher than in the previous year.

Notifications of cholera for 1938 were 375,000, a higher total than has been recorded in any of the previous twelve years for which figures are available. During the last quarter of the year 36,402 cases were recorded in Bengal; this is the largest number reported in that province in the last quarter of any of the years since 1927. The disease was prevalent in the Central and United Provinces during the summer months, but a considerable decline in incidence was observed during the last quarter of the year.

No. 8.

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended February 25, 1939.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 126 great towns (125 in 1938) in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1939					1938 (Corresponding Week)					1930–8 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	37	7	12		—	29	6	9	1	—		
Deaths		2	2				2	1				
Diphtheria	1,171	125	208	55	25	1,565	152	226	62	34	1,262	155
Deaths	26	5	4	6	1	34	3	5	4	—		
Dysentery	17	2	14		6	214	62	58		—		
Deaths				—	—				—	—		
Encephalitis lethargica, acute	3	1	2	1	—	4	—	—		—		
Deaths		1					—					
Enteric (typhoid and paratyphoid) fever	31	—	2	5	—	18	1	5	3	3	29	
Deaths	1	—	—	—	1	1	—	—	—	—		
Erysipelas			56	10	3			71	10	7		
Deaths		1					2					
Infective enteritis or diarrhoea under 2 years												
Deaths	39	7	7	7	2	66	22	4	5	2		
Measles		27	97		1			1,653		295		
Deaths	4	—	—	2	—	50	13	22	4	19		
Ophthalmia neonatorum	87	10	28		1	115	11	55		1		
Deaths												
Pneumonia, influenzal*	1,616	178	40	7	17	1,188	83	6	11	15	1,624	150
Deaths (from influenza)	285	67	34	1	3	59	11	4	1	3		
Pneumonia, primary			217	7				243	7			
Deaths				17	13		24		45	18		
Polio-encephalitis, acute	4	—				1	—					
Deaths		—					—					
Poliomyelitis, acute	5	—	1		—	6	—	—		—		
Deaths		—					—					
Puerperal fever	4†	4	17	1	—	4†	4	13	2	—		
Deaths		2‡					—					
Puerperal pyrexia	179	30	20		—	184	12	16		6		
Deaths												
Relapsing fever	—	—			—	—	—	—		—		
Deaths						—	—	—				
Scarlet fever	1,695	139	277	50	88	2,429	198	459	90	87	2,441	227
Deaths	3	1	2	—	—	2	—	1	—	—		
Small-pox	—	—	—		—	—	—	—		—		
Deaths	—	—		—	—	—	—		—	—		
Typhus fever	—	—	—	—	—	—	—	—	—	—		
Deaths				—	—	—	—	—	—	—		
Whooping-cough		254	515		38			40		13		
Deaths	20	6	10	—	—	16	2	—	2	2		
Deaths (0–1 year)	387	58	77	34	16	472	77	71	60	31		
Infant mortality rate (per 1,000 live births)	59	48				79	63					
Deaths (excluding stillbirths)	6,073	1,299	740	196	160	5,609	1,078	745	241	208		
Annual death rate (per 1,000 persons living)	14.9	16.5	15.0	13.2	14.2	13.8	13.6	13.8	16.3	18.4		
Live births	6,062	972	883	322	226	6,870	1,298	900	438	258		
Annual rate per 1,000 persons living	14.9	12.4	17.9	21.6	20.0	16.9	16.3	18.4	29.6	22.9		
Stillbirths	246	54	34			267	36					
Rate per 1,000 total births (including stillborn)	39	53	37			37	27					

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

† After October 1, 1937, puerperal fever was made notifiable only in the administrative county of London.

‡ Deaths from puerperal sepsis.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Secretary, B.M.A House. Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS.—All communications should be addressed to the Advertisement Manager (office hours 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and communications with reference to subscriptions should be addressed to the Secretary, B.M.A. House.

The TELEPHONE NUMBER of the British Medical Association and the *British Medical Journal* is EUSTON 2111.

The TELEGRAPHIC ADDRESSES are
EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*
SECRETARY, *Medisecra Westcent, London.*

The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh;* telephone 24361 Edinburgh), and of the Office of the Cumann Doctúirí na h-Éireann (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin;* telephone 62550 Dublin.)

QUERIES AND ANSWERS

Raynaud's Disease

Dr. F. O. TAYLOR (Coldingham, Berwickshire) writes: I would be grateful for information upon any recent advances in the treatment of Raynaud's disease of increasing severity in a man of 55. There seems to be some definite interference with complete digestion, and an irregular secretion of gastric hydrochloric acid, and no ordinary medication has been able to make any impression upon the condition.

Tapeworm

Dr. P. K. BANERJEE (Agra) writes in reply to "X.Y.Z." (January 28, p. 198): Failure to discover the head of the worm does not always signify that the worm will grow again. The worm may be killed by the anthelmintic administered and the head digested. It is better to wait until segments are being passed in the stools again before the next treatment is begun. If cure does not follow the repetition of the filix mas, either of the following prescriptions may be tried: (1) Ol. eucalypt., 30 minims; chloroform, 45 minims; ol. ricini to 1 oz.; (2) oil of turpentine, 30 minims; mucilago acaciae, q.s.; aqua carui to 1 oz.

LETTERS, NOTES, ETC.

Treatment of Diphtheria

Dr. H. S. CARTER (Glasgow) writes: In an article in your issue of February 25 (p. 384) on the treatment of diphtheria with refined antitoxin, I notice that the author, Dr. Alexander Hutchison, quotes certain figures from two papers of mine published in the *Journal of Hygiene* in 1933 and 1936. I do not accept these figures as quoted or the interpretations placed upon them. Anyone interested is advised to consult the original papers.

Sulphanilamide for Lobar Pneumonia in an Infant

Dr. NORMAN S. MARTIN (Birmingham) writes: A female infant of 13 weeks, of normal health and nutrition, had alarmed its mother at 3 a.m. on February 7 by its fast breathing, fever, flushed appearance, and vomiting. On examination at 4 a.m. the temperature was 103° F., the pulse rate 180, and the respiration rate 83; there were no chest signs. On February 10 there was well-marked bronchial breathing, confined to the right base. The temperature remained consistently high, and on February 13 had not fallen at any time lower than 101.5° F., although cold sponging was employed frequently. On this date the temperature rose to 104.5° F., the pulse rate to 220, and the respiration rate to 146. The child showed facial pallor, a distended anterior fontanelle, occasional vomiting, and a restless and vacant manner. An almost continuous cough prevented sleep and proper feeding. A regime of four-hourly rectal glucose and continuous oxygen by face-piece was instituted. On February 14 the infant was given one-quarter tablet of M & B 693 four-hourly in half an ounce of diluted milk. This was repeated for forty-eight hours (three tablets in all). On February 15 the clinical condition showed great improvement, the respiration rate having fallen to 82, the pulse rate to 160, and the temperature to 99.2° F., although the chest signs showed no change. The child made a quick recovery, and the breathing and breath sounds returned to normal in another five days. In view of the sudden onset, the continued high temperature, and the localization of altered breath sounds to the right lung I am inclined to believe that this was lobar pneumonia—though at such an early age. The cause of the paroxysm of coughing was not discovered, but in view of its croupy character was probably due to a superimposed laryngitis. Whether the crisis was brought about by the *vis medicatrix naturae* or by the pneumococcolysis of the M & B 693 is open to discussion; one feels intuitively that the life of this infant was saved by the drug. No toxic signs or symptoms followed its administration.

Cuttings to Pin Up

Dr. KENNETH HAZELL (Fordham, Ely) writes: I think it is generally admitted that medical treatments advertised in the public press and over the wireless fill the minds of the general public with false ideas, both about illness and about the medical profession. It seems to me that the public has a genuine complaint against the medical profession when they say they are left to the mercy of quack advertisements. From time to time I have pinned cuttings from the *British Medical Journal* in my surgery—for example, "Nutrition in Childhood," February 11, p. 285—which I have considered suitable for the public. Most of my patients take considerable interest in such cuttings, and I think if the method were generally adopted by general practitioners its influence on the public would be considerable. Since the B.M.A. has decided on a project of some form of propaganda, may I encourage you to print in the *B.M.J.* small articles suitable for pinning up in a surgery.

The Field of Chemotherapy

Dr. A. K. JAMES (Calne, Wilts) writes: Though the early diagnosis of ulcerative endocarditis can rarely be made with certainty, and the results of chemotherapy in established cases have been disappointing, the following case is of some interest. A girl aged 13 had an attack of chorea in 1931, and in 1936 rheumatic fever with mitral disease, followed in the same year by another attack of chorea. On December 8, 1938, she was seen at the conclusion of an attack of catarrhal jaundice, epidemic at that time; on December 12 she began complaining of pains in the wrists, ankles, and other joints, and was given salicylates in increasing doses, but no remission of either pains or temperature was obtained, the latter ranging about 101°–102°; no petechiae were seen nor was the spleen palpable; on December 21 she had a severe rigor, became unconscious, and had well-marked spasmodic contractions of the right side of the face, the temperature rising to over 103°; blood culture was negative. Treatment with M & B 693 was begun, using the dosage advised for lobar pneumonia; the temperature gradually fell during the next eight days to normal and the general condition improved until, on January 3, 1939, there was little abnormality apart from slight weakness of the right side of the face and a tendency to use wrong words—"bread-and-butter" was asked for as "caper," and a black doll was called a "white pearl." Two weeks later, except for the old-standing mitral lesion, the child appeared well, and has remained so since she has been up and about. While from the nature of this case the diagnosis must be unconfirmed, it may be that chemotherapy before the streptococci became firmly established on the heart valves saved this life, and further reports from those who have the opportunity of seeing similar cases at a really early stage would be valuable.

Corrigendum

Dr. J. MIDDLETON MARTIN (Cheltenham) writes: My attention has been drawn to two errors in my article "Tuberculosis—Dogmas and Doubts of Sixty Years" appearing in the *Journal* of February 4 (p. 204). The first two English cases of pulmonary tuberculosis with tubercle bacilli of the bovine type in the sputum were *both* discovered by A. Stanley Griffith and were reported in the Final Report of the Royal Commission on Tuberculosis (1911). The second error is the spelling of Professor S. Lyle Cummins's name, which was given as "Cummings" in two places.